

PATENTS FOR INVENTIONS.

ABRIDGMENTS OF SPECIFICATIONS.

CLASS 98, PHOTOGRAPHY.

PERIOD—A.D. 1855-1866.



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EXPLANATORY NOTE.

The contents of this Abridgment Class may be seen from its Subject-matter Index. For further information as to the classification of the subject-matter of inventions, reference should be made to the *Abridgment-Class and Index Key*, published at the Patent Office, 25, Southampton Buildings, Chancery Lane, W.C., price 1s., postage 6d.

It should be borne in mind that the abridgments are merely intended to serve as guides to the Specifications, which must themselves be consulted for the details of any particular invention. Printed Specifications, price 8d., may be purchased at the Patent Office, or ordered by post, no additional charge being made for postage.

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PHOTOGRAPHY.

Patents have been granted in all cases, unless otherwise stated. Drawings accompany the Specification where the abridgment is illustrated and also where the words *Drawings to Specification* follow the date.

A.D. 1855.

309. Pont, B. Feb. 9. [*Provisional protection only.*]

Negatives, producing by hand.—A sensitized collodion plate is exposed, developed, and fixed, and after washing is coated with dextrin and dried. It is then laid on a black background, and the artist draws the required design, using points, pens &c. and removing the collodion cleanly. The parts or design removed show black, from the background beneath, and if any masses appear too heavy, they may be lightened by applying silver white, diluted with water, with a fine brush. Prints are made by the means usual in photography.

426. Berchtold, A. J. Feb. 27. [*Provisional protection only.*]

Negatives for photo-mechanical printing, producing; photo-mechanical printing.—A grain is produced on a negative or positive photograph by printing the grain on its surface, or by perforating or making strokes, lines or dots by a roller or other instrument. The printing or other marks may be made on a separate sheet of paper. The perforations may pass completely or partly through the paper.

488. Garnier, A. L. March 5.

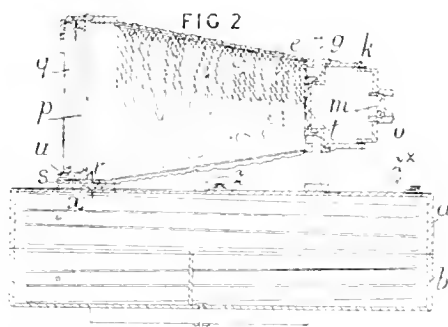
Producing coloured photographs.—A fabric such as linen is rendered transparent or semitransparent by coating it with a paste of rice flour and dipping it in a mixture of wax, Venice turpentine, and linseed oil. Gelatine may also be used. The surface of the prepared fabric is then sensitized and photographic prints made thereon. Alkaline salts, which may remain after ordinary washings,

are removed by immersing in pure alcohol. The colours are applied to the back and show through the semitransparent support. Photographic prints on paper may be used in the same way.

598. Petitjean, T., and Pêtre, L. March 17. [*Provisional protection only.*]

Sensitized plates.—The object is to give a perfectly smooth surface to the plates or sheets of electroplated copper used in the daguerreotype process. A piece of glass or other material with a smooth surface is electroplated first with a coating of silver. Over this is deposited a layer of copper, and over this a layer of iron or other metal. Plates thus formed are more sensitive to the chemical action to which they are exposed.

674. Bourne, J. C. March 27.



Cameras; dark rooms; tripod stands; shutters.—A camera is described with adjustments of back and front, and of lens diaphragms. The camera

when folded up is enclosed in a case which also contains a jointed framework for supporting a developing-tent. The case is mounted on a tripod stand, and the camera on the top of the case, which acts as a baseboard for the camera. Fig. 2 is a side elevation of the camera mounted on the case *a, b*. The back, containing the dark slide *p* and focussing-screen *q*, has both horizontal and vertical swing by turning on the hinge *r* and on a pivot connecting the plate *s* to the slide *x*. The slide *x*, the clamping-screws *u*, and the ends of the stays *z* slide longitudinally in guiding grooves in the top of the case. The front *g* and the stays *z** are adjustable in transverse curved grooves in the top of the case. The standard *g* is adjustable on a vertical axis. The lens board *e* is vertically adjustable on the standard *g*. The diaphragms consist of a graduated series of

FIG. 13.



FIG. 15.

apertures in a slide *m* by adjusting which transversely any aperture may be brought opposite the lens *t*. The distance of the diaphragm from the lens may also be adjusted by sliding the tube in which it is mounted in the tube *k*. The shutter is a slide *o* with an exposure aperture, which slides transversely in front of the diaphragm. The developing tent is erected by turning down the lid *a* and raising the pivoted stays *A* from the box *b* so as to support the waterproof cloth or covering *F* as shown in Fig. 13. The box *b* contains developing and washing basins and the necessary chemicals. It also contains a hinged developing stand fitted with a spirit level. The head and hands of the operator are inserted through the opening *G* which is then contracted by a string *fl*. The tripod stand is shown in plan

in Fig. 15. Each leg *J* is in two halves connected by a spring *M*, and held on the pins of the tripod top *I* by an elastic band *L*.

770. Rollason, A. April 7.

Sensitized plates and films; colouring.—Relates to transferring a collodion photograph after colouring to paper, linen, cardboard, bone, ivory, wood, metal, or stone. After a photograph has been taken on collodion coated on glass, colours are applied, and the film is varnished. Paper, linen or other material is then cemented to the collodion film by a mucilage preferably of gum arabic and honey. The paper with the collodion photograph adhering to it is then stripped off the glass. The collodion film may be transferred to the paper before the photograph is taken.

917. Smyth, C. P. April 24.

Tripod and like stands are made hollow to secure lightness, and can be filled with water &c. when great steadiness is required.

1523. Gedge, J., [Samson, L.], July 7. [Provisional protection only.]

Transparencies are formed by burning the silver into glass, or by retaining the photograph and using a cover glass. The types (negatives) are arranged in a frame which is placed behind a second frame furnished with drawings or designs for combining with the types. The types (negatives) are copied on to a positive plate by means of a large lens. The proof (transparency) is formed on a sensitized plate coated with albumen and collodion. The colour of the burnt-in transparency may be changed to "bistre" by the action of oxide of iron. The oxide of iron may be combined with the silver by using protosulphate of iron as the developer.

1581. Gaudin, P. I. A. July 13. [Provisional protection only.]

Trays and dishes used as baths are surrounded with a double casing of metal into which a freezing mixture or water at any desired temperature may be placed.

1914. Archer, F. S. Aug. 24.

Sensitized plates and films.—After the negative is fixed, a solution of gutta-percha in benzene or the like is poured over it and allowed to dry. The operation may be repeated until the film of gutta-percha is sufficiently thick. The film is then stripped off, carrying the collodion with it, water or other solvent being used if necessary to detach the collodion from the plate. The plate

may be coated with gutta-percha before applying the collodion, in which case the film may be varnished before stripping it off, or the surface may be coated with gutta-percha, so that a film is obtained with gutta-percha on both sides of it. The films are used as ordinary negatives for printing. Negatives for this process may be made on metal or other plates in place of glass.

2112. Cornides, L. Sept. 19.

Sensitized plates; printing.—Glass plates coated with gelatine or glue, as described in Specification No. 2066, A.D. 1854, are printed with positive designs or pictures, from negatives, by known photographic means.

2139. Clive, J. C. Sept. 25. [*Provisional protection only.*]

Producing composite photographs.—Relates especially to collodion positives. A portrait or group is taken on glass and the background is removed. A scene to form a background is then taken on the other side of the glass or on a separate sheet which is placed behind the first. Figures or objects taken at different times can be brought into one picture.

2381. Mayall, J. E. Oct. 24.

Sensitized plates; printing.—Positives are printed on artificial ivory instead of paper, metal, or glass. One form of artificial ivory is made by immersing tablets of glue or gelatine in a bath of alumina in sulphuric or acetic acid. Alumina may be mixed directly with glue or gelatine and the mixture made into sheets. Bone or ivory dust may be worked into paste with albumen or gelatine and the paste rolled into sheets. The sheets are hardened by exposure to the air and are then cut into tablets. A mixture of 2 parts of baryta and 1 part of albumen is made into slabs in the same way. The tablets when made are scraped, washed in alcohol, and prepared in the usual way for printing positives.

Clearing.—After printing, and before fixing, the slabs may be dipped in nitrosulphuric or nitrohydrochloric acid to improve the pictures.

2555. Mawson, J. Nov. 13. [*Provisional protection only.*]

Cameras; lens fittings.—At the back of the camera a shutter or screen is placed which serves as a permanent focussing cloth. The body is made of cloth, and a conical tube of flexible cloth connects the body with the lens bracket. The bracket is fixed on a slide operated by a screw for focussing. The base of the camera is fitted with a slotted plate, so that the position of the camera can be adjusted. To render the camera more

portable, the lens tube may be dispensed with and the lens be fixed in the bracket, a flexible tube being provided which can be drawn out in front.

2573. Möller, J. Nov. 14. [*Provisional protection only.*]

Producing coloured photographs.—A transparent positive is produced and transferred to ivory by means of a "gelatine or glass medium," and is coloured by hand.

2808. Hay, G. H., and Hay, D. S. Dec. 12.

Colouring.—Photographic pictures are coloured or tinted with oil paints. In the case of a picture on collodionized glass, the film is varnished with amber varnish. The film may then receive a coating of drying oil and varnish or other suitable medium, oil or other moist colours or dry pigments being applied while the medium is moist. If the second coating is dispensed with, moist colours only can be employed. After colouring, the picture may be finished in any desired style and be coated with varnish.

2815. Poitevin, A. L. Dec. 13.

Chromo-gelatine processes; producing coloured photographs; photo-mechanical printing.—In producing a photographic print on lithographic stone, metal, glass, wood, or other suitable material, there is applied to the surface one or more layers or films of a mixture consisting of equal parts of a concentrated solution of albumen, fibrin, gum arabic, gelatine, or similar organic substance, and a concentrated solution of chromate or bichromate of potash, or of any base which does not precipitate the organic matter of the first solution. The film is then dried, if the design or impression is to be obtained by contact printing. After exposure, the film, if previously dried, is moistened, and greasy ink is applied, which will only adhere to those parts which have been affected by light. The print thus obtained may be retained on the surface on which it was produced, or transferred and printed on paper or other suitable material by a lithographic printing process. In the chromo-gelatine mixture may be added colours, so that coloured pictures may be thus obtained on paper, glass, or cloth by washing away the portions unaffected by light during exposure.

2816. Poitevin, A. L. Dec. 13.

Chromo-gelatine; photo-mechanical printing; processes.—A plate is coated with gelatine and is plunged into a solution of potassium bichromate or other salt of chromic acid. The plate may be dried before treatment, or the gelatine may be allowed to set without drying, or the bichromate may be mixed with the gelatine before coating

the plate. After exposure in the camera, or under a negative transparency, the plate is plunged into water, which causes the parts not acted on by light to swell or expand. A reverse is now taken by casting with plaster of Paris or by electrotyping. For taking a plaster cast, the plate is treated with ferrous sulphate and then washed, to remove excess, before the plaster is poured upon it. For electrotyping, the surface is metallized by treatment with potassium iodide

and silver nitrate, exposure to light, and, finally, reduction by means of ferrous sulphate. From plaster moulds, metal plates are obtained by stereotyping or electrotyping. From a plaster mould, a reverse mould may be taken in plaster, if required. The plates obtained may have hollows corresponding to the dark parts, as required for copper-plate printing; or the darker parts may be in relief and be printed from like type or wood engravings.

A.D. 1856.

646. Maw, A. March 18. [*Provisional protection refused.*]

Ornamenting by photography.—Surfaces of woven, knitted, or felted fabrics, ribbons, parchment, vellum, leather, &c. for books, dresses, furniture, &c. are made sensitive to light, and pictures or designs are printed on them from negatives.

660. Hall, J. B. March 19.

Mounting prints and the like.—Facsimile or duplicate photographs are cemented upon one or more glass plates in such a manner that their lines coincide, the second picture forming a background to the first. The photographs, after being treated with oil to render them more or less transparent, are cemented either on to the opposite sides of one sheet of glass, or on to two separate sheets of glass, which are then cemented together. One or both of the photographs may be coloured or cut away in corresponding or different parts, or additional coloured backgrounds may be employed. The photographs are protected from the atmosphere by the cement or varnish and by the second or additional sheets of glass, and may be viewed either by transmitted or by direct light.

875. Schultz, L. April 12. [*Provisional protection only.*]

Sensitized plates. Glass or metal plates are coated with varnish, preferably of a dark colour, to give them a smooth surface,

896. Olley, W. H. April 15. [*Provisional protection only.*]

Photo-micrography. A microscope is provided with a reflecting-prism or other reflector attached to the eye-piece. The camera is mounted above it, so that the image is reflected upwards on to a ground-glass plate. The ground-glass plate is carried by a frame or box sliding within the camera body, so that the plate can be raised or lowered to alter the size of the image. After adjustment, the ground-glass plate is removed, and a sensitized plate is substituted and exposed by withdrawing a shutter. The plate may be coated with iodized collodion and developed by ferrous sulphate, gallic acid, &c.; or other sensitized plates or papers may be used.

1078. Mayer, L. F. May 8. [*Letters Patent void for want of Final Specification.*]

Printing fabrics.—Woven fabrics have the surface prepared in the same way as paper to render it sensitive for receiving a photographic image.

1123. Parkes, A. May 13. [*Provisional protection only.*]

Sensitized plates and films; positives, producing directly.—Collodion sheets are used as supports for sensitized collodion films, or a sensitized film is prepared on a thick layer of collodion on a glass plate and the whole stripped from the plate after the picture is finished. When making positive pictures the back of the collodion plate may be coated with black flexible varnish, or the plate of collodion which supports the picture may be black.

1159. Thistlethwaite, W., [*Angamavre, L.*].
May 16.

Printing.—A collodion print is prepared on glass and is placed on any fabric or other material by single or double transfer, after which it may be coloured. The collodion is made thick with gun cotton and contains ammonium bromide, chloride, and iodide. The sensitizing solution is silver nitrate. The developer contains protosulphate of iron, and acetic and sulphuric acids. Potassium cyanide is used for fixing. The collodion picture is transferred by pressing blotting paper on to the surface, stripping, and pressing the collodion on to the fabric, after which the blotting paper is removed and the print glazed by treating with alcohol. A second method of transferring is to float the collodion picture off in water containing a small amount of hydrochloric acid. The loose film is then lifted on the glass and directly transferred to the fabric where it is smoothed down.

1295. Fowke, F. May 31. [*Provisional protection only.*]

Cameras.—To enable the frame of the camera to be brought to lie close together and packed in a small space, the bottom is dispensed with, and the front of the camera is given sufficient rigidity to sustain itself by being constructed in the form of a four-sided cone, each side being hinged and differing sufficiently in length to fold down flat one over the other, so as to be enclosed in a shallow frame.

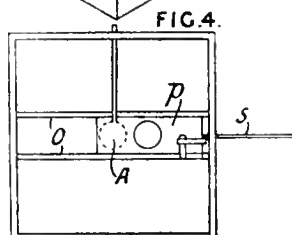
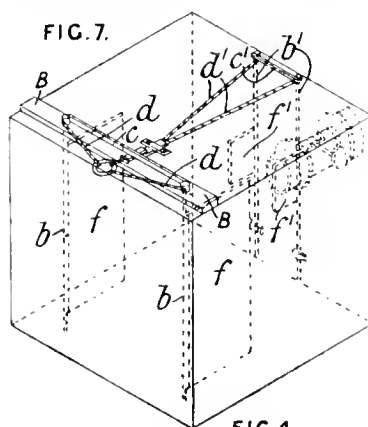
1344. Dallas, D. C. June 5. [*Provisional protection only.*]

Chromo-gelatine processes; sensitized plates and films.—In making chemical preparations for photographic and photo-galvanographic processes, a solution of chromic acid, with or without a solution of iodide of potassium, or nitrate of silver, is added to a solution of gelatine.

1373. Skatfe, T. June 10.

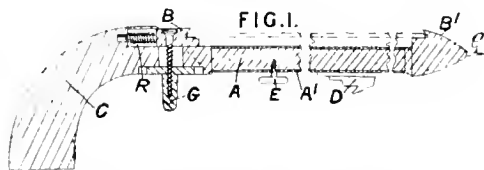
Dark slides; shutters.—Fig. 7 shows a camera with the dark slide attached, and one form of shutter. The dark slide or frame B is provided with shutters *f* attached to spindles *b*. The shutters may be opened inside the camera by pulling strings *d, d* connected with the spindles, and closed by an elastic band *c* attached to the two spindles, or other spring. Lens shutters *f'* inside the camera, behind the lens, are opened by cords *d', d'* attached to the spindles *b'* outside the camera, and closed by an elastic band *c'* attached to the two spindles. The cords for operating the shutters *f, f'* may be connected as shown in the drawing to operate the two sets of shutters at the same time. Another form of lens shutter, Fig. 4, consists of a plate *p* with a circular aperture, which slides in glass guides *o* inside the camera, behind the lens A. The shutter is drawn to one side of the camera by an

attached cord secured to the closed end of an enclosing rubber tube *s*, and is held there by a catch: when released it is projected by a spring to make the exposure. The shutter may be



placed at any angle to the horizon, or vertically and it may be made of steel and a magnet placed at one end of the guides *o* may be used to increase its speed.

1651. Avery, J., [*Millot, —.*]. July 12.



Lifters or holders, plate and like.—The plate is held, for coating with collodion &c., between jaws B, B'. The jaw B is pressed forward by the spring R and is moved back to release the plate, by the stem G. The jaw B' is fixed to the tube A' which slides on the rod A attached to the handle C. The tube A' can be fixed in different positions by the screw E. For small plates, the extra jaw D is brought into use. For manipulating a large and heavy plate, the point *e* may be pressed into a wall or door.

1716. Gaudin, M. A. A., and Choumara, E. X. July 21.

Emulsions, making.—Meat and bones are boiled with water in a double-cased boiler heated with steam under pressure. The boiler is not

quite filled with liquid, and when a cock is opened in an exit tube an emulsion is produced by the juice rushing violently out into suitable vessels. Instead of meat, gelatine, grease, or oil, may be used, the product forming an animal food. Wax and resins may also be used to produce a milky liquid for use in the arts.

1983. Perry, J. Aug. 26.

Chromo-gelatine processes; developing; printing; sensitized films; toning.—Relates to methods of making prints. The surface of paper, linen, cotton, wood, or metal is preferably sensitized with chromate of ammonia, bichromate of potash, or other combination of chromium or chromic acid with soda, silver, tin, lead, zinc, bismuth, iron, cadmium, antimony, or nickel. In the case of paper, the surface may be previously treated with gelatine or size. After exposure and washing, the print is toned with a salt of iron, such as protosulphate, although the acetate, nitrate, tartrate, citrate, oxalate, chloride or phosphate may be used. The print is then washed with a solution of gallic or pyrogallie acid or tannin. The iron may be employed with the chromium as chromate of iron or the iron salts may be used in combination with ammonia without the previous use of chromium. Where great strength or depth of colour is required, soluble salts of silver, tin, lead, zinc, cadmium, antimony, nickel, or bismuth, with or without ammonia, may be applied before the chromium. To produce colour, "cyanogen" and other analogous articles used in dyeing may be used.

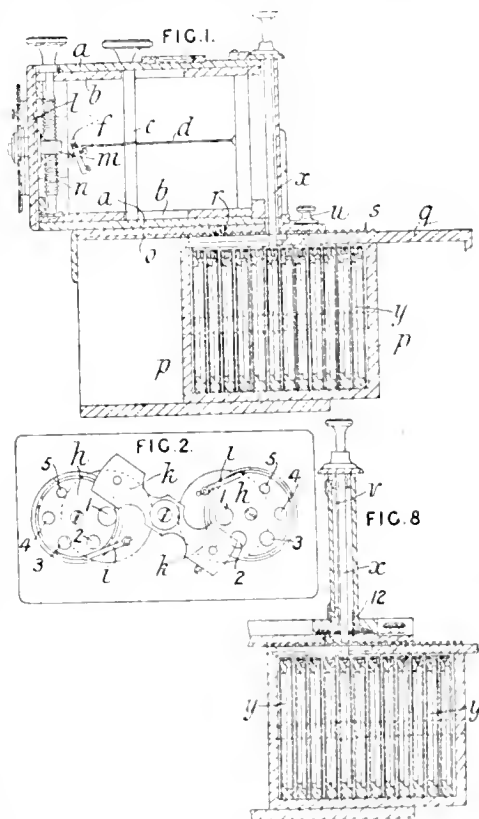
2029. Norris, R. H. Sept. 1.

Sensitized plates and films.—Collodion films or plates are so prepared as to permit them to be used in a dry state. The film after removal from the nitrate of silver solution, or after washing and while still wet, is saturated with some substance to fill the pores of the film and keep it in such a condition after it has become dry that it will allow the penetration of developing and fixing solutions. Solutions of gum arabic, dextrin, starch, gelatine, albumen, gluten and such like substances may be used for this purpose. The effect may also be produced by introducing suitable chemical substances into the collodion or nitrate of silver solution. Sensitized collodion and other films are transferred from glass plates to flexible supports of gelatine by pouring a strong solution of gelatine over the film, coating the gelatine when dry with plain collodion, and then stripping from the glass.

2064. Dancer, J. B. Sept. 5.

Cameras; change-boxes; dark slides; lens fittings; shutters.—A stereoscopic camera, Fig. 1, is provided with an outer box or body *a* in which slides an inner box *b* carrying the lens front. The box *b* is moved to adjust the focus by a

grooved spindle *c* round which is passed a chain *d* attached at one end to the box and at the other to a lever *f* for adjusting the tension. The focussing may also be effected by a pinion engaging with a rack on the box *b*. The sliding front *l* carrying the lenses is adjusted vertically by a screw *n* engaging a nut *m* on it. A change-box, attached to the camera, Fig. 1, is provided with a sliding inner plate box *p* containing a series of rectangular frames or plate carriers *y*, and a sliding lid *q*. The lid may be clamped to the camera by screws *u*, and the box *p* moved in the outer casing *o* by a grooved spindle *r* engaging the racks *s* to bring any of the plate carriers *y* beneath an opening in the camera body. When in position, the carriers can be drawn into the camera by the rod *x* and



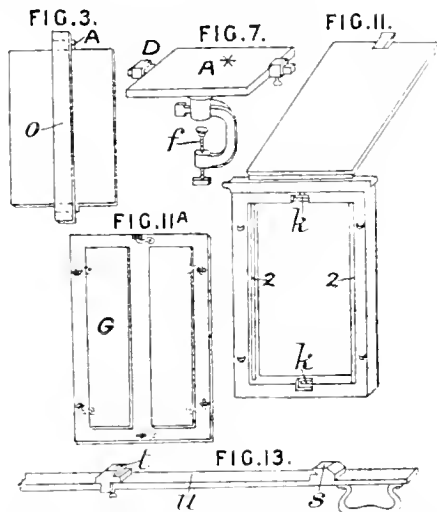
after exposure of the plate returned to the box *o*. A focussing frame may be lifted into the camera and returned in the same manner. The rod *x* may screw into sockets in the carriers *y*; or the carriers may be dispensed with and the screw sockets attached directly to the plates. The rod *x* may also be provided with a clip for holding the carriers or plates. The box *p* may be fixed in position and the rod *x* moved longitudinally in slots in the top and bottom of the camera to enable it to be brought successively over the carriers *y*. Scales are provided to indicate when the rod *x* is in position over the carriers *y*. A change-box such as that in Fig. 1 may be separate from the camera as shown in Fig. 8. In this case

the carriers *y* are drawn by the rod *x* into a dark frame or slide *r* adapted to be placed over the opening in the top of the plate box, and the bottom of *r* is provided with an aperture which may be closed by a hinged shutter 12 when a carrier is in the slide. Another form of change box is provided with a sliding lid of more than double the length of the box; the end of a dark frame or slide is inserted in an aperture of the lid and brought over any one of a series of plate carriers by sliding the lid, and the carrier can then be lifted into the dark slide by a rod such as the rod *x* referred to above. A circular or other liquid level is permanently attached to a camera. Revolving diaphragms *h*, Fig. 2, provided with apertures 1, 2, 3, 4, 5, and held in position by springs *i* engaging indentations, are pivoted before the lenses of stereoscopic and other cameras. The diaphragms may be made to slide instead of revolve and the areas of the apertures may be made of known relative proportions. A plate or shutter *k*, Fig. 2 working on a pivot between the lenses of a stereoscopic camera is used to cover or uncover the lenses, and its motion is limited by stops.

2072. Johnston, J., [a communication].
Sept. 5.

Sensitized plates; positives, producing directly.
—Plates of sheet iron or other metal coated with black japan are used instead of glass to receive a coating of collodion.

2092. Sabatier, B. Sept. 8.



Sensitized plates; dark slides; developing; lifts or holders, plate; trays and dishes; printing; drying; positives, producing directly.
—Relates to plates for receiving sensitized films and apparatus for manipulating sensitized plates, chiefly for use in wet plate processes, but partly applicable to daguerreotype and like processes. Glass, silvered, and other plates are formed with

end projections *A*, Fig. 3, or such projections may be attached to them, to dispense with the necessity for the operator applying his fingers to the plates. A rectangular box or frame is described in which plates may be placed to ensure attached projections *A* being placed in the proper position. A glass strip *o* may be secured to the plate by ferrules and wedges of silver or silvered material engaging the projections *A*. To facilitate cleaning, the glass or other plate is secured by screw clamps *D*, Fig. 7, to a table *A** which may be fixed by a screw *f* to a suitable support. A table for polishing plates is described in which the plate is held by a screw clamp gripping the attached strip *o*. A dark slide or frame, Fig. 11, is provided with recesses *k*, *k* to permit the insertion of plates, Fig. 3, with strips *o* attached. The back *G*, Fig. 11^a of this frame or slide is secured by hooks and staples as shown. Sensitized paper may be held in this slide for exposure in the camera between glass plates resting in projections 2, 2. An instrument or stand is provided in which the strip *o* may be held whilst the plate is detached from it. For developing, the plate is clamped between the parts *s*, *t* of the holder, Fig. 13. The part *t* slides on a strip *u* and can be fixed in any position. A rectangular bath of glass or porcelain &c., for holding nitrate of silver for sensitizing plates, is provided with projections *A* at each end of the bottom on which the projections *A* of the plate Fig. 3 rest. A clip consisting of two levers pivoted together and closed by a spring is used for inserting plates into and removing them from the bath. A frame, in which plates with projections *A*, Fig. 3, fit, is provided for insertion in an ordinary printing frame, and a strip of india-rubber is placed in the frame for the edge of the plate to rest upon to prevent breakage. A stand or table with openings in the top and adapted to receive a spirit lamp beneath it, is used for holding plates whilst heated. For bromidizing, iodizing &c. a frame is used adapted to receive plates Fig. 3 with strips *o* attached, and glass strips are placed over the joints to prevent evaporation of the ingredients in the frame.

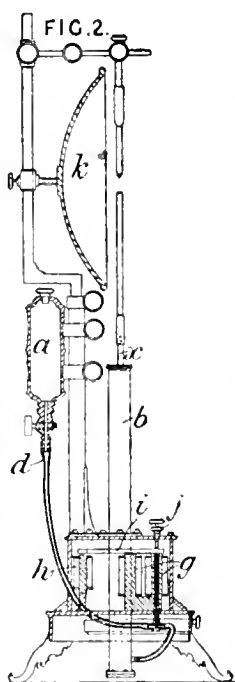
2254. Langlois, C. Sept. 26.

Cameras; colouring; dark slides; finishing; mounting; sensitized plates.—Relates to constructing a camera with one side formed by doors, one of which closes at an angle of 45° with the front and is provided with an opening for examining the picture while focussing. The opening is provided with a light-tight sleeve, so that the arm of the operator can be inserted for the purpose of opening the dark slide. The dark slide is formed with hinged doors back and front, the face of the back door being white to act as a focussing screen. The slide is provided with central pivots engaging in the camera so as to allow of rotation to reverse the dark slide between focussing and exposing. The camera is provided with screw feet. Positives are prepared on collodion plates which are first coated with a layer of gum to allow of stripping. After exposure, which is done by artificial light, the finished

positive is coated on its face with plaster of Paris in layers alternating with layers of muslin &c. To remove the glass, the print and backing are soaked in warm water to dissolve the gum; the collodion surface may then be removed with ether. To prepare the surface for colouring the backing is saturated with spermaceti &c. A final backing of metal or millboard may be secured by shellac. The Provisional Specification refers to varnishing the surface of the transferred or original print, and colouring with dry colours, which are afterwards set by warming the varnish. Wood, papier mâché, paper pulp, japanned metal, silvered glass, talc, alabaster or marble may also be used as backing. The printing may be done with a lamp enclosed except for a small aperture through which the light passes to a printing-table so that the exposure can be regulated; weak natural light may also be employed for pictures on collodion, albumen, or other vehicle.

2456. Lacassagne, J., and Thiers, R. Oct. 20.

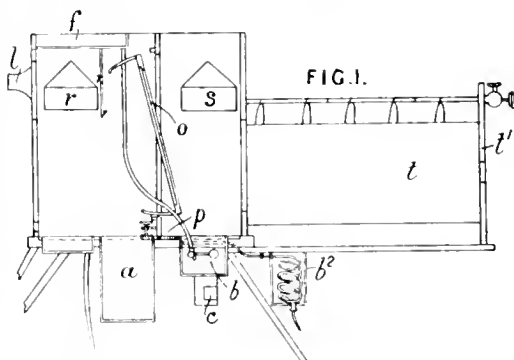
Lamps, actinic.—In a photo-electric arc lamp, the lower of two carbons is supported by a rod *x* on an iron piston in a vertical cylinder *b*, to which mercury is supplied by a flexible tube *d* from a reservoir *a*, to feed up the lower carbon. The feeding is controlled electro-magnetically by passage of the mercury up and down through passages in one limb of a series electromagnet *y*, which acts on an armature *i*, carrying an india-rubber valve to stop the passages. The armature *i* is movable in the opposite direction, to open the passages, by a shunt electromagnet *h* or a spring, this movement being limited by a screw stop *j*. The upper carbon is secured adjustably on the stem of the lamp by a screw, and a reflector *k* is provided.



2614. Olley, W. H. Nov. 6.

Photo-micrography.—Images produced by the object glass of a horizontally placed microscope, from which the eye-piece has been removed, are reflected by a glass prism or other reflector placed near the eye-piece end on to a sensitized plate or surface in a dark box or camera enclosing the end of the microscope and the reflector.

2806. Palmer, H. E. Nov. 26.



Cameras; dark boxes; lens fittings; developing; fixing.—A camera is arranged so that plates may be sensitized, developed, and fixed inside it. The camera is provided at the bottom with a bag *a* to hold a vessel of nitrate of silver and a tank of water *b* heated by a lamp *c*. Vessels *r*, *s* for supplying developer and fixing solution, and a water supply reservoir *f* made of waterproof fabric, are arranged at the top of the camera. Steam is condensed by a condenser *b*² through which water flows from *f*. Eye-pieces *l* and windows protected by yellow glass and opaque shutters are provided. The plate is held during exposure in a pivoted frame *o* adjusted by a rack and pinion *p*, and sleeves with elastic rings for the arms of the operator are provided at the sides or back of the camera. The lens is carried by a frame *l*¹ attached to a flexible tube *t*, the frame being clamped at any desired distance from the frame *o* by a set-screw as shown. In cold weather the apparatus is warmed by the lamp *c* and tank *b*, or by means of a lamp and metal plate. The lens cap is hinged to the camera and operated by a handle on the pin of the hinge. In order that the apparatus may be packed into a small space the sides of the camera and other parts may be made of waterproof fabric.

2871. Cheetham, J. K. Dec. 3.

Photo-mechanical printing.—A photograph is transferred to copper or other metallic surface, and a printing-surface produced by etching. A photograph on glass obtained by the collodion process is coated with a varnish composed of shellac and borax dissolved in water, and a sheet of paper coated with the same varnish is then applied to it. When dry it is placed in water and the film stripped from the glass with the paper. The copper &c. surface is coated with mercury by ordinary means, and the film is pressed on to it, when by the application of gentle heat the film may be removed, leaving the silver image or picture upon the metallic surface. Zinc, silver, steel, &c. may be coated with copper and treated as described. In a modified process the film is removed from the glass by the use of a solution of gutta-percha dissolved in benzene, and after applying to the metallic surface, removing it by

dissolving with methylated chloroform or other solvent. Printing-surfaces are prepared by etching the metal plate, treated as above, with a substance such as nitric acid to produce a relief surface. Lithographic printing-surfaces are produced by rendering the stone electrically conducting, by coating with phosphorus &c., and depositing on this a film of copper. The photograph is transferred on to this, as above described, and the bare copper then dissolved away. The stone is then rolled up with ink and the metal picture removed.

2887. Kloen, W., and Jones, D. Dec. 5.
[Provisional protection only.]

Positives, producing directly; sensitized plates; ornamenting by photography.—For positive col-

lodion pictures, materials are used which present a black surface and are not brittle, such as papier mâché, metal, wood, &c., covered with varnish or japan. The plates on which the pictures have been taken may be applied to trays &c. made of papier mâché.

3009. Massi, C. Dec. 19. [Provisional protection only.]

Cameras.—When two cameras are used for taking stereoscopic pictures, a stand attachment is provided by which the required inclination is conveniently given to the cameras. In the surface of a suitable stand are two parallel slits or openings to receive studs or projections on two bars underneath, the cameras being attached to the studs. The bars are actuated by screw shafts to adjust the inclination of the cameras.

A.D. 1857.

501. Glover, J., and Bold, J. Feb. 20.

Sensitized plates.—White or tinted opal glass, or other substance suitable for forming dials and tablets &c., is treated or prepared for receiving photographic impressions of portraits and other pictures either directly in the camera, or by printing. The surface is reduced or deadened by treatment with fluoric acid or by grinding. Pictures &c. printed on surfaces thus prepared are capable of receiving colours. The picture or impression is coated with transparent varnish formed of shellac and alcohol, or otherwise.

624. Newton, W. E., [a communication].
March 3.

Printing; toning; fixing.—Photographs are printed on paper, for banknotes and the like. They may be silver prints made on large sheets of paper from a number of negatives in one frame. These negatives are copied from a daguerreotype, or from a positive silver print on paper, made from an original albumen or collodion negative on glass. The prints are made on salted paper coated with an ammoniacal silver nitrate solution, and are fixed in a solution of hyposulphite of soda, gold chloride, and silver oxide.

Photo-mechanical printing.—Photographs for the above-mentioned purpose may be printed mechanically in ink from electrotypes, made by deposition on an original negative.

1005. Purnell, J. April 9. [Provisional protection only.]

Cameras; change-boxes; developing; washing; sensitized plates and films.—Relates to improvements on the invention described in Specification No. 179, A.D. 1852. To facilitate the sensitizing of the plates, within the camera, a bath containing the sensitizing-fluid is let into the bottom of the camera. Over the back is suspended a clamp, the two jaws of which press against the edges of the plate so as not to damage the sensitized coating, the clamp and plate being depressed into the solution by a rod, and then held in position for exposure. The plate when exposed is removed from the clamp and placed in a drawer at the bottom of the camera, this being effected by introducing the hand through a sleeve into the interior of the camera. The drawer, which is covered by a slide, is removed for developing the plate. To facilitate inspection during development, the top of the drawer is fitted with a cover having apertures fitted with yellow glass, the

bottom of the drawer being also composed of yellow glass. In the side of the cover is a pocket, made of a flexible, light-proof fabric, to contain a bottle for the developing-solution. There is a trapped hole in the side of the cover, and a valve at the bottom to permit of the insertion and withdrawal of water for washing the plate after being developed. For obtaining stereoscopic pictures, the lens, which is mounted on a slide, as ordinarily, is pushed first to one side, and then to the other side of the camera, so as to be opposite different parts of the plate, a suitable partition being provided, which can be turned out of the way by a button on the outside to remove the plate. The camera, to enable it to be moved for taking the second stereoscopic picture, is arranged to slide on a board which is capable of turning on a centre carried by the tripod, the movement being controlled by adjustable stops.

1253. Moseley, T. B. May 4. [*Provisional protection only.*]

Lifters or holders, plate and like.—To a wooden handle is fixed an annular piece of wood &c. in which is placed a bell-shaped piece of india-rubber connected by a wire to one end of a horizontal lever, the fulcrum of which is a pin passing through the handle. On forcing down the lever, the india-rubber is raised in the wooden ring, producing a partial vacuum, and causing the india-rubber to adhere to any article against which it is placed. The lever may be held by a sliding link or other means.

1511. Newton, W. E., [a communication]. May 27.

Sensitized plates; photo-mechanical printing.—Engravers' blocks are prepared for receiving a photographic impression by rubbing into the surface a varnish consisting of asphaltum varnish, lampblack, and ether. Several thin coatings may be rubbed in. The block is afterwards coated with collodion and sensitized with nitrate of silver, and, after exposure, is developed, fixed, and washed.

1835. Newton, W. E., [*Nègre, C.*]. July 1.

Photo-mechanical printing; ornamenting by photography.—In a process for producing ornamented metal or other surfaces, and intaglio or relief printing-surfaces, the surface to be treated is coated with light-sensitive organic materials, which are also capable of protecting the surface from acids or electrolytic action. Bitumens dissolved in essential oils, gelatine and benzene, or albumen and gums, with the addition of potassium bichromate, are suitable coating-materials. The coated surface is exposed in a camera or under a photographic negative or positive, according as the finished surface is to be used in copper-plate or letterpress printing. The parts of the coating not acted on by the light are then washed away by a solvent, such as naphtha, benzene, water, &c. The remaining parts act as a

resist in the further treatment of the surface. The exposed parts of the surface may be eaten away by sulphuric, nitric, or other acid, or by means of an electric current. In the latter case, the plate is used as an anode in an electrolytic cell containing a solution of a salt of the metal to be removed or of a metal of the same nature. In operating upon zinc, steel &c. to obtain a relief engraving, a reversed photographic negative is used. After the first part of the engraving process, the parts attacked are wetted with gum solution and the gelatine &c. coating is covered and strengthened by ink applied by means of a roller. A steel plate engraved in this manner may be used as a matrix from which designs may be struck. A relief engraving may also be produced by exposing a coated copper or silver plate under an ordinary photographic negative and removing the soluble portions of the coating. A copper deposit then produced by electro-deposition on the plate is removed, and a proof is taken from it in printers' ink on thin and lightly-sized paper. This proof is applied to a metal, marble, stone, &c. surface to act as a resist in the deposition of another metal coating in the manner already described. The original metal plate if polished, may otherwise have the parts not covered by the photographic resist covered with a protecting film by exposure to air to act as a resist in the removal of the gelatine and the underlying parts of the plate by acid to form intaglio or relief engravings. Reproductions in copper of an engraved steel plate are obtained by depositing first gold or platinum and then copper upon it, detaching the deposit, and finally forming a second deposit on the first. In another process, a sensitive coating of a silver or other suitable metallic salt is exposed as described above. The salt in the parts of the coating acted on by the light is reduced to the metal in order that a layer of copper may be deposited upon it. This reduction is carried out by immersion in a bath of gallic acid and silver nitrate in the case of silver, by immersion in a solution of a metallic salt and subsequent exposure to phosphorus vapour, or by a lengthened exposure to light. In some cases, a layer of copper filings is spread over the whole picture, after the copper deposit is of sufficient thickness, in order to allow of the further deposition of copper to connect up the previously deposited parts into a solid plate.

1843. McCraw, W. July 2. [*Provisional protection only.*]

Positives, producing directly upon porcelain, white or opal glass, ivory, bone, mother of pearl, prepared wood, or enamels. The slab of porcelain &c. is coated with collodion and sensitized with silver nitrate. After exposure it is treated with a weak solution of ferrous sulphate, pyrogallie acid or other developer, and is immediately washed. It is then momentarily exposed to the action of subdued daylight or artificial light and is immediately treated with a developing fluid, when the image appears as a positive but reversed. To obviate this reversal, a negative is taken on glass and placed in front of the camera, and a

mirror is placed behind the image at an angle of 45°. The porcelain &c. slab is then exposed, developed and fixed with cyanide of potassium or hyposulphite of soda, and finally washed. At this stage chloride of gold may be applied. The picture is dried, heated, varnished, and it may be coloured. Positive transparent photographic slides for the stereoscope on white, opal or transparent glass may be produced by this process.

2058. Baxter, E. W. July 28.

Ornamenting by photography; sensitized plates and films.—For producing plain or ornamental writing, and ornamental designs, in gold, silver, and other metals, and in pigments and colours, upon glass surfaces, which are used for labels, advertising tablets, &c., the part of the glass to be ornamented is first coated with weak isinglass size and overlaid with say gold or silver leaf. The metal leaf is then backed with a photographic varnish in a solvent such as naphtha or any suitable spirit, a solution of an asphaltum varnish, like Brunswick black, in turpentine being preferred. A negative of the device to be copied, either on glass, gelatine or thin or transparent paper, is placed over the backed surface, which is then exposed to light. The unfixed varnish is removed with turpentine or other solvent and the exposed gold and silver removed by means of damp cotton wool. The design may be finished by hand, when open letters or devices are to be filled in with colour. When using pigments in place of metal leaf, they are mixed with a resinous varnish or gold size and thinly spread on the glass, which is then treated as before. Frosted silver devices for bordering mirrors are obtained by coating the glass with suitable varnish as before and overlaying it with a positive pattern on transparent or semi-transparent paper, which in this case is used as a negative. The unfixed pattern is washed off with solvent, and this exposed glass surface acted on with fluoric acid. The varnish is then cleaned off and the ornamented surface silvered in the usual way. In the Provisional Specification benzene, camphine, or any essential oil is stated to be used to dissolve the photographic varnish.

2295. Elliott, R. Sept. 1.

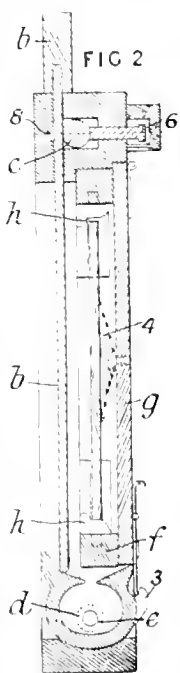
Negatives, producing by hand; copying drawings and the like; printing.—To enable pictures to be reproduced with all the truth of an engraving, a negative is specially prepared by hand so as to give the precise lights and shades. With this view a suitable piece of glass is brushed over with a thin, transparent paste or the like, and on this the outline of the picture is traced. Then a dark-coloured cloth is placed behind the glass, and the picture, in one colour, is painted on the glass, with the desired shades. From this an impression is taken on sensitized paper by printing in the ordinary way. An impression of lace or similar fabrics may be obtained by using the lace &c. fixed to glass, as a negative.

2315. Ferrier, J. A. Sept. 4. [*Provisional protection only.*]

Producing transparencies.—Transparencies are prepared on a surface of gelatine, dissolved gutta-percha, collodion, dissolved india-rubber, siccativ oils, mucilaginous substances, starch, or other amylaceous substances such as arrowroot, tapioca, &c., soluble or fusible resins, galipot, pounce, or white or yellow wax, either dissolved or melted. The positive is prepared by coating a surface of porcelain, alabaster, white marble, glass, &c. with collodion. After drying, the surface is flooded with albumen, and is drained and dried. The prepared surface is sensitized with aceto-nitrate of silver and is washed and dried before exposure. The positive is developed with gallic acid, fixed, and coloured. The positive is coated with gelatine &c. which may be coloured, and, after complete drying or cooling, is stripped by first cutting round near the edge. The transparencies may be stereoscopic.

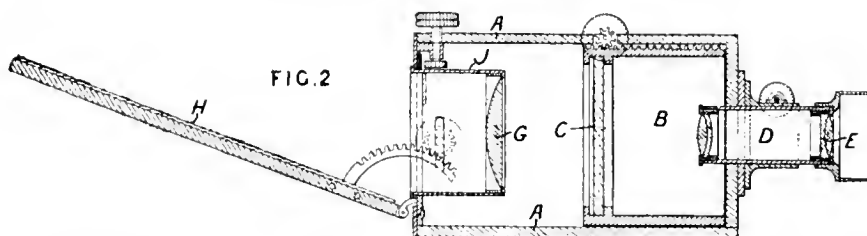
2332. Lewis, W., and Lewis, W. H. Sept. 7.

Dark slides for wet plate processes. The slide is provided with a cut-off rod *c* of black glass &c. which is held up to the draw slide *b* or the recess *8* by a spring *6*. The end of the recess holding the rod *c* is closed by a cork to facilitate the removal and cleaning of the rod. The lower part of the slide is fitted with a long bottle-shaped trough *d* to receive dripping from the plate. The trough is provided at one end with a neck *e* which can be closed by a cork. The carrier frame *f* is recessed at the corners to receive flanged solid corner pieces *h* of glass or other inactive material to support the plate; *g* is the back closing door, *4* the pressure spring, and *3* is a projection for the securing-catch.



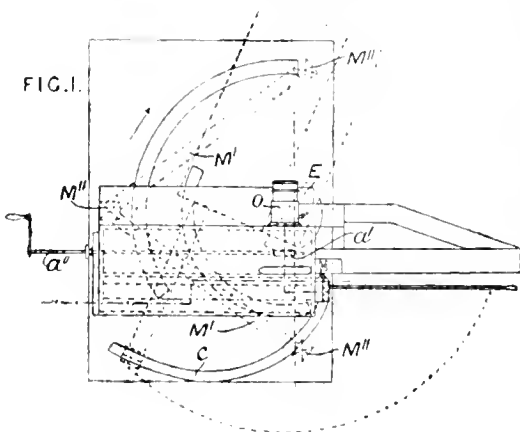
2459. Newton, A. V., [Woodward, D. A.]. Sept. 22.

Cameras; enlarging.—A box camera is arranged for projecting the image of a negative on a sensitized surface for producing a print, or for projecting the image of a positive on a suitable surface for tracing or painting. The apparatus consists of a box camera A with focussing-lens D and an internal focussing carrier B for the negative or positive C. The negative &c. is illuminated by



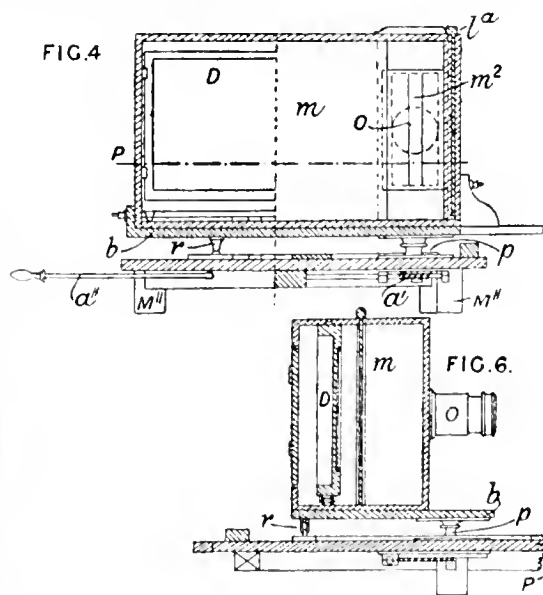
sunlight by means of a plano-convex lens G mounted in a rotatable sleeve J to which the reflector H is pivoted. The reflector H and sleeve J are adjusted by racks and pinions.

2560. Brooman, R. A., [*Gavella, —.*], Oct 6.



Cameras for taking panoramic pictures, either negatives or metal positives. The camera, Figs. 1 and 6, is arranged with the lens O set at one end of the front and situated opposite an adjustable slot m^2 in a screen m which divides the camera longitudinally. The back of the camera is provided with a door opposite the slot m^2 for focussing. The plate carrier D has bearings so that it can move freely in and out of the camera, an outer projecting portion having rollers for engaging with curved guides on the camera support. The draw slide of the plate carrier has a projecting stop which engages inside the stop l^a on the camera when the slide is drawn out for exposure. The camera is clamped to a board b pivoted at p and running on a circular guide by a bearing r . The pin p is extended downwards through the table P and carries a semicircular worm-wheel E, Fig. 1, which is driven by a worm a' on the crank shaft a^{11} for the purpose of rotating the camera during exposure. The table P is a rigid plane surface provided with strengthening ribs M^1 , M^{11} , and has two curved guides for supporting the camera. A third guide c is arranged for withdrawing the plate-carrier. This curve has to be adjusted for the focus of any particular lens and also according to the width of the opening in the slot m^2 so as to produce the correct amount of traverse of the plate. In the

case of taking a metal positive a reflector prism or mirror is placed in front of the lens and the camera is traversed in the opposite direction; the details of the arrangements are otherwise identical except that the turning pivot is placed further back i.e. behind the carrier. The plate carrier is preferably formed of two parts; an outer frame which fits the camera is shaped internally to receive a separate plate-carrier, and provided with the traversing and supporting guide-rollers. The inner plate-carrier is made as a frame to fit into and be secured in the outer

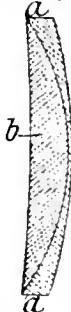


carrier and is closed at the back by a hinged door provided with pressure springs for holding the plate up to position. Catches are provided for holding the door closed. When using metal plates for positives the pressure springs may be omitted. To view the panoramic pictures, the picture is mounted by means of hooks or otherwise in a hollow semicylindrical case the radius of which is equal to the focal length of the lens with which the photograph was taken. A lens of the same focal length for examining the picture is mounted on a vertical pivot in the axis of the case.

2574. **Grubb, T.** Oct. 8.

Lenses.—A lens which may be used as a view lens, or in combination with other lenses of similar or ordinary construction, is composed of flint glass *a* combined with crown glass *b*, shaped as shown.

FIG. 2



2792. **Sweet, H. K.**, [a communication].
Nov. 3. [Provisional protection only.]

Sensitized plates; producing photographs of special character.—Portraits or pictures are taken on concave or convex glass or other surfaces.

2903. **Gill, S.**, and **Newton, H.** Nov. 19.
[Provisional protection only.]

Cameras, stereoscopic. A pair of reflectors, making an angle with one another, is placed in front of a camera to reflect two pictures of an object.

3066. **Cowper, C.**, [Beauregard, T. de].
Dec. 12.

Chromo-gelatine processes.—Prints, transparencies, or negatives are prepared on paper, glass, collodionized glass, ivory, wood, &c. by first coating the surface with a mixture of ammonium or potassium bichromate and gelatine or gum arabic with a slight addition of albumen. After coating, the dried surface of the gelatine is treated with finely pulverized colouring-matter such as plum-bago, lampblack, indian ink, or any ground pigment of the desired colour. The colour may be applied by a dry process, a greasy process, or a wet process. In the dry process, the carbon or other pigment is applied with a pad or rubber; the pad may be moistened with alcohol. In the greasy process, the pigment is ground up with nut oil or other suitable oil and may be applied with a pad or roller. The paper, after coating, is at once treated with ether, alone or with a little collodion, so as to remove the oil and set the colour. In the wet process, a bath of the pigment, such as indian ink, is prepared by grinding the pigment with water and gelatine and a small quantity of gum arabic or dextrin. A bath of indian ink with alcohol may be employed. After exposure, the print is developed and fixed with hot water. Powdered gold or silver may be employed and different parts of the surface may be treated with different coloured pigments.

A.D. 1858.

23. **Lavater, M. L. J.** Jan. 7. *Disclaimer.*

Lifters or holders, plate, acting by pneumatic pressure. An india-rubber disc is placed on the edge of a wooden cup, on the top of which is placed a rotary cylinder with a screw-threaded hole which engages a spindle passing through the cup and attached to a button on the india-rubber disc. On turning the cylinder a partial vacuum is formed beneath the disc, causing the holder to adhere to the plate. Other methods of producing the vacuum may be used.

357. **Newton, W. E.**, [Cutting, A., and Bradford, L. H.]. Feb. 23.

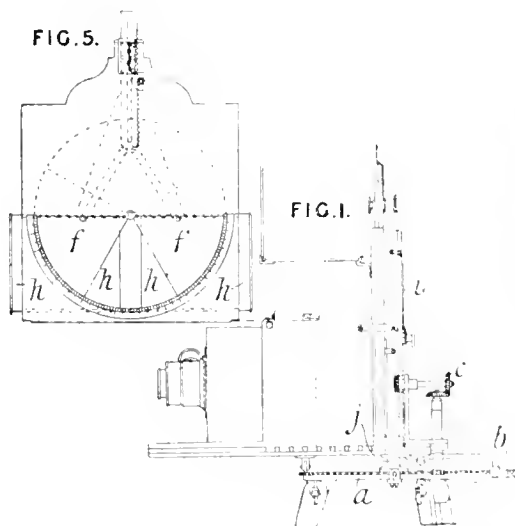
Photo-mechanical printing.—For the preparation of designs on stones or zinc or other plates, the plate is coated with a solution of gum arabic

in water to which sugar and bichromate of potash have been added. When this is dry the plate is exposed in a camera or under a negative, and is then washed with a solution of soap to dissolve away and remove the unexposed parts of the gum coating. The soap attaches itself to, or forms an insoluble soap on, the parts of the plate from which the gum is removed. The plate is then washed with water, dried, and rolled up with ink which unites with the soap deposited or formed on the plate, the parts covered with the undissolved gum acting, when wetted for printing, to repel the ink. The plate is grained to break up the gradations of tone. Molasses, acetic acid, or acetates may be added to the gum solution in place of sugar. Instead of removing the unexposed parts of the coating with soap solution, they may be washed off with water, or acetic acid &c., and oils, resins, or printing-inks applied to the plate after it has been dried.

396. Clark, W., [*St. Victor, M. N. de.*
Feb. 27. [*Provisional protection only.*]

Sensitized plates and films; toning; transparencies; photo-mechanical printing.—Surfaces are sensitized with salts of uranium, preferably the nitrate. The exposed print is treated with a solution of silver nitrate, after which it is fixed by washing in water. The print may be toned with gold chloride. The uranium print may be treated with a solution of mercuric chloride before treating with the silver or gold solution. The uranium print may also be directly treated with the gold solution. The uranium solution may be replaced by a solution of tartaric, citric, arsenious, lactic, or oxalic acid, or of aluminium sulphate, iron citrate, or neutral potassium tartrate. Negatives may be made with the uranium prepared paper or with the uranium nitrate mixed with gelatine and gum on glass. For the purposes of engraving on steel, or for litho-photography, a salt of uranium may be substituted for potassium bichromate for rendering gelatine insoluble.

636. Chevallier, F. A. March 25.



Cameras; producing panoramic photographs on circular plates.—The apparatus may be used for obtaining prints for strategical purposes and for application to fans, and for taking plans, and it is stated that stereoscopic views may be obtained from the pictures. The sensitized circular plate is mounted in a toothed frame capable of being rotated through the exact angle that the camera is rotated. The camera is mounted on a pivot *j* in the centre of a toothed and divided circle *a* which forms the head of a tripod. The camera carries a worm shaft *b* gearing with the toothed circle *a*, and is also provided with bevel gearing *c* so that the plate can be rotated synchronously with the camera; a compass is mounted on the camera and a corresponding index *i* is placed on the back of the plate holder. The stand and

camera are provided with various adjustments. The focussing front is connected to the back by retractile springs. The plate may be exposed in steps or continuously, the amount of the exposure field being regulated either by pivoted adjustable sectors *f*, Fig. 5, or by horizontal slides *h*. The plate holder is provided with hinged doors at the back. The camera may be used for taking ordinary instead of panoramic pictures.

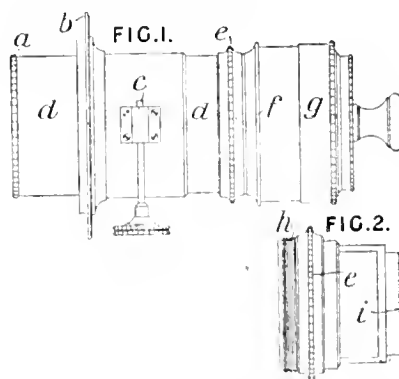
725. Sarony, O. April 5.

Producing composite photographs by printing and retouching. A portrait is taken on two or more negatives so as to obtain the head, hands, &c. in proper proportion, a composite print being made from the several negatives by masking. The neck may be lengthened by spacing the head from the shoulders, the parts being filled in by retouching. The various parts may also be lifted from the negatives and placed on a sheet of glass in the printing-frame, the parts being positioned as desired and the print being finished by an artist.

780. Pouncy, J. April 10. [*Provisional protection only.*]

Chromo-gelatine processes; colouring; printing; sensitized plates and films.—The paper or other surface intended to receive the picture is prepared by applying to it colouring matter together with the substance which is sensitive to light. In printing from negatives, the paper or surface is coated with a composition of vegetable carbon, gum arabic, and bichromate of potash. After exposure the surface is washed with water which dissolves the parts unacted on by the light. For the vegetable carbon, bitumen, or other colouring matter, may be employed.

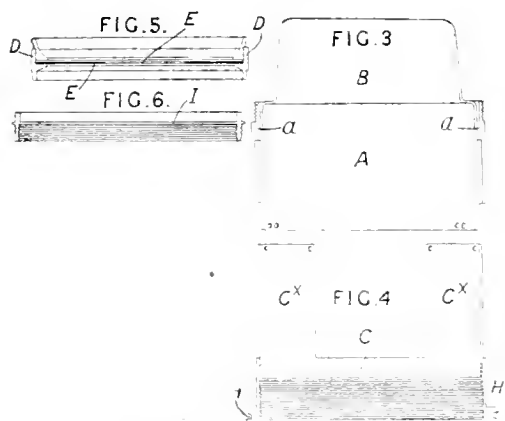
860. Derogy, E. April 20.



Lens fittings.—The lenses are fitted by bayonet joints into a tube *d*, provided with adjustment means *c* and with a flange *b* for fixing it to the

camera. A lens *a* takes into one end of the tube, and a lens *h*, fitted in the diaphragm holder *e*, is mounted in the other end of the tube. In connection with the holder *e* is a fitting *i* for receiving either of two additional lenses adapted to the kind of work to be done. A sunshade *f* is fixed on the holder *e* and a cap *g* takes over this shade. The lens *a* may be replaced by the lens *h* for some classes of work, the sunshade *f* and cap *g* being placed on the end of the tube *d*.

887. Maugey, P., [partly a communication]. April 22.



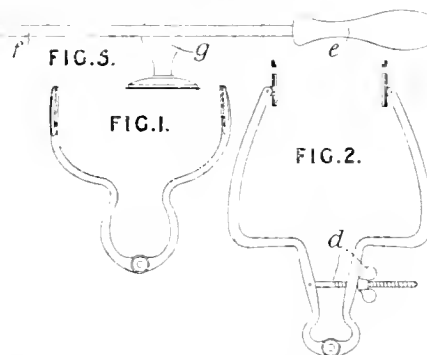
Lens fittings.—Stops are made of elastic material, the aperture being varied by stretching the material. The upper part of the cylinder *C*, Fig. 4, is cut away, leaving only three lugs *Cx*. These lugs pass through slots *a* in the cylinder *A*, Fig. 3, and their ends project slightly beyond the end of the tapered extension *B* of the cylinder *A* and are fastened to a ring *D*, Fig. 5, which grips an elastic diaphragm *E*. The end of the cylinder *A* projects slightly beyond the end *H* of the cylinder *C* and is fixed to the internally and externally screwed ring *I*, Fig. 6, by which it may be attached to a camera. The size of the opening is regulated by pressing the piece *B* against the diaphragm by means of a rack and pinion, or otherwise.

1084. Warren, F. May 14. [Provisional protection only.]

Tripod and like stands.—A telescope is mounted so that it may have horizontal, vertical, and equatorial motions. A horizontal plate, No. 1, has at its centre a tube, boss, or pin, upon which another plate, No. 2, rotates and gives a horizontal motion. Upon plate No. 2 a support is built, to which is attached a vertical plate, No. 3. The vertical movement is obtained by placing a fourth plate upon No. 3. A cradle is placed upon plate No. 4, for holding the instrument. The equatorial motion is obtained by attaching a plate No. 5 to the plate No. 4, and a sixth plate works upon it;

a cradle is attached to plate No. 6. The motions can be obtained by hand, worm gearing, or by friction rollers. Movable discs or plates, similar to those described, are placed below plate No. 1, for supporting it, and to these plates sockets are attached into which tubes are inserted which form props or legs, and the plates to which they are attached, with those attached to plate No. 1, form the joints on which they move.

1136. Bryer, S. May 21.



Lifters or holders, plate.—Forceps for lifting plates from the sensitizing bath to the camera, and for holding a plate during development and the like, are described. For large plates a sucker which may be furnished with a handle is used. The first kind of forceps is shown in Fig. 1. The second kind for use in developing &c. is fitted with a clamping screw and nut *d*, Fig. 2. The sucker *g* mounted on handle *f*, *e* is shown in side view in Fig. 3.

1221. Girerd, J. B., and Wohlgemuth, P. F. May 31. [Provisional protection only.]

Tripod stands of wood or metal are decorated and stained by the agency of metallic salts and oxides. Designs, letter press, type printing, or writing are placed on the different woods or substances, thus effectually acting in such a manner (by the instrumentality of light and shade on the surface) as to preserve uniformly the original ground forming the drawings, shapes or configurations, as are sought to be reproduced, from the influence of daylight or solar rays, at the same time modifying any colours that may be placed, or that may be existing thereon. The process is completed by varnishing or French polishing.

1231. Grant, A. G. June 1. [Provisional protection only.]

Tripod and like stands.—A stand or rest for a camera, theodolite, gun, &c. comprises a table for supporting the article, such table being carried by a rod, sliding in a split ring or collar located in a boss to which three or more supporting legs are hinged. When the legs are folded up they

form a cylinder. A rod fixed to each leg is connected to a collar through which the shaft passes. The rod carrying the table is secured in an adjusted position by means of a screw passing through the split ring.

1501. Sarony, O. July 3.

Colouring; finishing.—Paintings upon ivory are imitated by means of paper photographs, to which a medium is applied, which penetrates the paper, destroys its opacity, and allows the artist's work to appear floating within the substance of the paper. For this purpose, the paper on which the photograph has been taken is stretched on a frame having a movable panel, so that the back of the photographic picture may be uncovered when required without unstretching. The photograph is then colored in the ordinary way with water colours on the front side until the picture is worked up to the required finish; the panel at the back is removed, the photographic picture is placed face downwards upon a hot metal plate, and the back is, by a brush, covered all over with melted bees' wax until the paper is perfectly saturated and the wax appears at the other side. The photographic picture may now be mounted like any piece of ivory upon a light or cream-coloured ground of paper, enamel, or other substance. A similar effect may be produced by using oil, varnish, or gum, to give a semi-transparency to the paper. The paper may be impregnated before colouring.

2295. Baxter, G. Oct. 14.

Colouring; photo-mechanical printing.—Photographs are coloured by printing from wood blocks, engraved plates, lithographic stones &c. For colouring them by means of wood blocks, as many positives as it is desired to use blocks are taken from a negative on to transfer paper, the said negative having a series of dots made in the margin. The surfaces of the wood blocks are coated with flake white and gold size and then with transfer varnish. A positive, painted by hand with a composition of vermilion, mastic, varnish, and turpentine on the parts to be coloured by one of the blocks, is laid on a block, and the marking transferred to the surface by pressure. When the transfer varnish has hardened, the paper is washed off by means of dilute acid, the drawing remaining on the block. The marked block is then engraved by hand. Register is obtained by puncturing the sheets to be printed with holes exactly corresponding with the dots on the negative, two of the said holes being placed over two register points on the tympan of the press when printing each colour. Stereotype plates may be prepared in the same way as wood blocks. For colouring photographs by intaglio printing, tracings, one for each colour, are transferred to a series of copper plates, and each plate is engraved or etched in accordance with the tracing. Register is obtained in a similar manner to that described above, the dots being traced on to the copper plate, and points let in where the dots are; the sheets

to be printed have corresponding holes, which are placed over the points. For colouring by printing from lithographic stones or zinc plates, the parts to be coloured with each tint are drawn in transfer ink on a series of photographs printed on lithographic transfer paper. The register is obtained in the usual manner, or by means of dots. Another method of operating consists in transferring tracing to the stones or plates, and making the drawings for the different tints on the stones or plates themselves.

2342. Stortz, P. C. Oct. 20. [*Provisional protection only.*]

Sensitized plates; printing; positives, producing directly.—Plates of copper or other metal, panels of wood, millboard, canvas, &c., with oiled or varnished surfaces, are sensitized for printing or for producing direct positives.

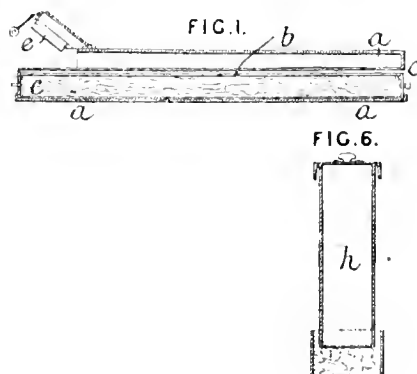
2367. Stortz, P. C. Oct. 23. [*Provisional protection only.*]

Enlarging.—A transparent positive or a negative is placed in the camera and exposed to daylight, while the lens points towards an easel in the dark room. The enlarged image is then traced on paper, cardboard, canvas, or glass, with Indian ink, paint, chalk, &c., by hand, or is copied photographically on sensitized paper, &c.

2425. Johnson, J. H., [*Tournaehon, G. F.*]. Oct. 29. [*Provisional protection only.*]

Producing bird's-eye views.—These are taken from a balloon, either free or anchored by three ropes. The camera is fitted with the lens vertically downward into the side or bottom of the car, which may be covered with black silk or other fabric, having a removable covering of yellow silk or other fabric to supply light to the operating chamber. The lens is covered and uncovered by a cap operated by a lever and cord, or a rotating horizontal disc.

2961. Marion, C. M. A. Dec. 27.



Receptacles for printing-paper.—Fig. 1 shows one form consisting of rectangular box *a*, divided into two parts by wire gauze *b*, the upper part containing the printing paper, whilst the lower part contains a drawer *c* with calcium chloride in it. The lid of the box is hermetically closed by a strip of rubber *e*. In another form one box with

a perforated bottom fits hermetically on another box containing calcium chloride. Fig. 6 shows a cylindrical box *h* for containing a roll of paper, of this form. A reservoir of calcium chloride, which may be used separately, consists of a frame having its bottom formed of a zinc plate and the upper surface of muslin and wire gauze.

A.D. 1859.

51. Spence, W., [Boyle, C. B.]. Jan. 7.

Sensitized plates and films; printing; toning; fixing.—To print photographs on wood, the wood is coated first with albumen and gelatine, then sensitized by applying a solution of salt and nitrate of silver. The image, which is over-printed, is treated with hot toning and fixing solutions, which remove the gelatine and efface all parts of the picture except such as are printed directly on the wood. When the block of wood has been previously whitened, a gelatine coating is not used. The picture on the wood may be used to facilitate engraving, or stereotyping.

344. Sims, T. Feb. 7. [Provisional protection only.]

Photo-mechanical printing.—A surface of glass or other suitable material is covered with a film of collodion, and if desired, also has a further film of albumen or gelatine. A photograph is then produced on this surface, either in the wet or dry process, and acted upon if necessary by bichloride of mercury and ammonium chloride of gold, or other chemicals to make the lines of the picture swell out or rise and become absorbent. This part of the process may be left out if desired. The picture is then given a thin coat of varnish, and before this has dried on the non-absorbing parts, the picture is dusted over with powdered resin, gluten, gum, metallic powder, starch, sand or other suitable powder. The picture may now be transferred to transfer paper or other suitable flexible material, or to stone, copper, steel, or zinc to produce a lithograph, or after applying powdered resin, and fixing by heat, the glass surfaces may be etched by hydrofluoric acid, and then printed from. The surface may also be metallized, and an electrotype prepared from it, or in any other known way the plate may then be prepared for or converted into a printing-surface.

444. Saillard, B. Feb. 17. [Provisional protection only.]

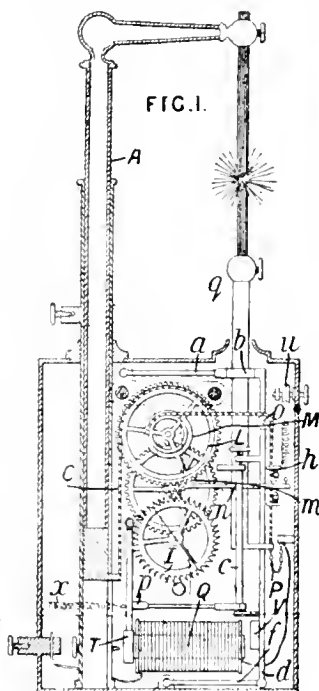
Photo-mechanical printing.—A glass plate coated with collodion is exposed beneath a negative or positive of the drawing to be reproduced and is

developed by means of a solution containing water pyrogallie or gallic acid, and nitrate of silver; it is then fixed, washed, and dried. The resulting image is treated with solution of bichloride of mercury, washed with bichromate of potash solution, and then with distilled water; when dry, the design will appear on the glass plate in relief. The design, which may be coated with photographic varnish, is next submitted to the electrotype process for the purpose of throwing down copper or other metal thereon by electro-deposition, and a reproduction in metal is obtained suitable for yielding impressions in ink of the raised picture or design produced upon the glass.

653. Clark, W., [Serrin, V. L. M.]. March 15.

Lamps, actinic.

—An arc lamp of the clockwork focussing type is constructed as shown, in one form. The positive upper carbon is carried by a tube *A* sliding vertically in an insulated slotted stationary tube, the sliding tube being connected by an insulator and a chain *C* to a large pulley *L*. The lower carbon-holder *q* slides vertically in two guides *b*, *n* on a frame *d*, and is supported by a chain passed over a pulley *o* on this frame to a small pulley *M*, attached to the large pulley *L*, so that the arc remains stationary as the carbons burn away, with con-



tinuous current. The frame *d* is movable vertically, being guided by swinging links *a, f*. When no current is passing, a spring is adjusted by a pulley *u* to hold up the frame *d*, so that a projection on the frame bears lightly against a stationary screw *h*. When the normal current passes through the carbons and a series electromagnet *Q*, this attracts an armature *V*, and lowers the frame *d* with the lower carbon-holder, thus striking the arc; at the same time a pawl *m* on the frame *d* engages and stops a toothed wheel *I* geared to the double pulley *L, M*. As the carbons burn away, the electromagnet *Q* allows the spring to raise the frame *d* with the lower carbon, until the pawl *m* releases the wheel *I*, and allows the double pulley *L, M* to be turned by the weight of the upper carbon-holder *A*, the carbons being thus fed together. In order to break apart the carbons if their points cohere, the lower carbon-holder has a forked arm in engagement with a vertical rod, not shown; this rod forms one side of a gate *c* pivoted on the frame *d*, and is linked at *p* to an armature lever *T*. This is attracted by the straight end of the electromagnet *Q*, in opposition to a spring *x*, when current passes through the lamp, and the gate and lower carbon-holder are thus turned relatively to the upper carbon. Electric connection with the frame *d* and lower carbon is provided by a chain *P*, which also compensates for the varying weight of the lower carbon. In modifications, the upper carbon may be carried by a vertical rack in gear with a large toothed wheel, in place of the tube *A*, chain *C*, and pulley *L*. The toothed wheel *I* may be replaced by a flyer, or by a wheel to be acted on by a brake-spring in place of the pawl *m*. The armature *V* may be of *U*-form, to enclose the electromagnet *Q*, the second armature *T* and carbon-turning mechanism being dispensed with. The armature *V* may be connected by a lever to the frame *d*. The armature *V* may be stationary

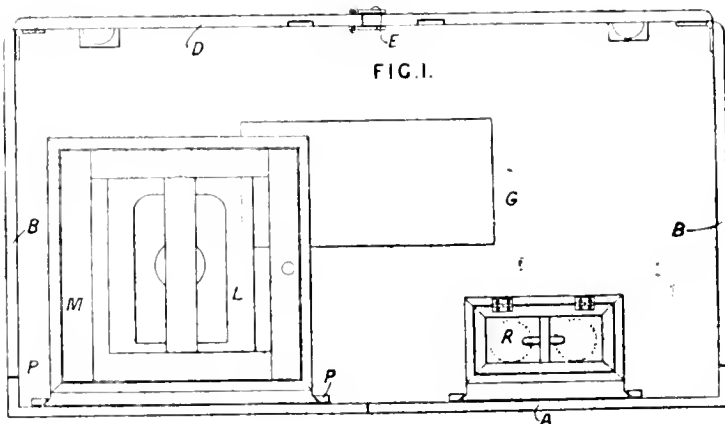
and the electromagnet *Q* movable. The electromagnet *Q* may be replaced by a solenoid. The frame *d* may carry a spring bearing frictionally against the lower carbon-holder *q*. The links *a, f* may be replaced by springs, and the supporting spring by a weighted lever. The lower carbon may be stationary. The frame *d* may be applied to the upper carbon-holder; or both carbons may be so controlled, and arranged horizontally, or inclined.

1139. Hart, F. W. May 6. [Provisional protection only.]

Printing.—A printing frame is constructed in such a manner as to admit of adjusting thereby the negative stencil or mask on the prepared paper or surface, and securing the same thereon as required. A frame, capable of being moved in any direction over the bed on which the prepared surface is fixed, is secured in the required position by screws, so as to hold the stencil mask or negative on the prepared surface ready for printing. This frame is hinged at one end, so that the reverse end may be raised when required in order to inspect the picture as a whole, and afterwards secured in its position without disturbing the original arrangement of the stencil mask or negative on the prepared surface. To adapt the said movable frame for holding tablets or surfaces to be printed from of various sizes, a curved or other slide is applied thereto so as to be capable of being moved along the frame to the position required in order to grasp or hold the printing tablet or surface. Vulcanized india-rubber, or other similar elastic material, is applied to the bed or backboard for the prepared surface to rest upon, in order to facilitate the bringing of the printing and the prepared surfaces into the required close contact.

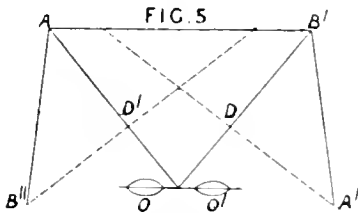
1156. Jeffery, W. May 7.

Dark boxes; cameras; camera stands.—The base of a dark box and camera stand is made of two parts *A* hinged together and fastened by cross-bars and thumb-screws, the sides *B* are hinged to the base board, and top sections *D* are hinged to the sides and connected by hooks and eyes *E*, or hinges. Frames *L, M* for carrying the lens and sensitive plates are supported in a vertical position by hinged brackets, and the frame *M* is arranged to slide in guides *P*. The frames of the box are covered with stout cartridge paper and



American cloth or light-excluding material, and a square or panel of oiled silk or yellow calico is fitted in the side G to admit yellow light. A stereoscopic camera R is mounted on one half of the base, which is made with a slit or aperture for the attachment of a bag containing the sensitive solution. The apparatus is covered with a double thickness of calico reeved in by a tape and fitted with a curtain and apron extending to the ground. The lenses are covered by bags with elastic rings, and right-angled ventilating-tubes allow air to pass, but exclude light. The tripod legs are secured by pins to angle plates fixed to the cross-bars under the base.

1463. Vasserot, C. F., [*Corbin, H. A.*], June 17.



Cameras; producing stereoscopic photographs.—Stereoscopic views of extra size are taken in a camera shown diagrammatically in Fig. 5. The lenses O, O' are placed in front of reflectors D, D', the plate holders being situated at A, B¹¹ and A', B'. For stereoscopes having a single reflector, one of the views is produced inverted by placing the plate in the camera with its unprepared surface towards the object.

1653. Proal, C. J., [*Bernard, J.*], July 12.

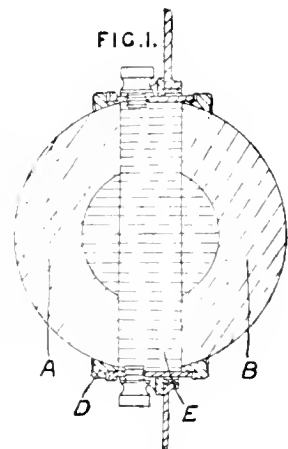
Ornamenting by photography.—Consists in applying to oilcloth, glazed cotton, leather, and other fabrics or tissues, one or more photographic impressions, and employing the fabrics thus prepared for making up pads for writing-blotters, chimney fronts, table covers of any form, lamp and other stands, portfolios, purses or money holders, tea trays, covers for books and journals, and other similar articles, and more especially such articles as boxes, and objects of cardboard. The fabrics having received photographic impressions may be ornamented with gilt thread, or gilt decorations of any kind, and enriched by designs of various colours appropriate to the photographic subjects. The photographic pictures may be coloured or ornamented. A varnish may be applied over the photographic impressions to preserve their duration and brilliancy.

2081. Collins, H. G. Sept. 12.

Photo-mechanical printing.—In a photographic method of preparing printing-surfaces upon stone or similar material, a photograph is taken upon a sheet of vulcanized india-rubber sensitized with an aqueous solution of potassium bichromate, sugar, and gum arabic, the sheet is extended or contracted to the size required, as described in Specification No. 439, A.D. 1858, [*Abridgment Class Printing other than letterpress &c.*], and the exposed coating is transferred upon the stone &c. and washed with a mucilage preparation preferably consisting of an aqueous solution of gum arabic and yellow soap. According to the Provisional Specification, the coating is washed with mucilage and acetic acid. In a modification, the sensitized coating is applied to stone &c., exposed, washed with mucilage, and charged with ink, and then an india-rubber sheet is used to transfer the design upon the printing-surface.

2193. Sutton, T. Sept. 28.

Lenses and lens fittings.—A lens for taking wide-angle views consists of two partly spherical pieces of glass A, B having concentric faces. The lenses A, B are set in a collar E by means of screw flanges D. The flange E slides in a collar and is provided with screw plugs for enabling the interior to be filled with liquid having a low refractive index. The two parts A, B may be identical, or the radii of curvature of the faces of the two parts may be different. A diaphragm stop may be placed across the centre of the cavity. For large lenses, two thin curved plates of glass may be secured together with a filling of Canada balsam. The Provisional Specification refers to the use of an external conical box with open ends, the smaller end being placed against the surface of the lens, having thin opaque partitions radiating from the centre of the lens in planes at right angles to each other to take the place of the internal diaphragm. The picture should be taken on a spherical or cylindrical plate.

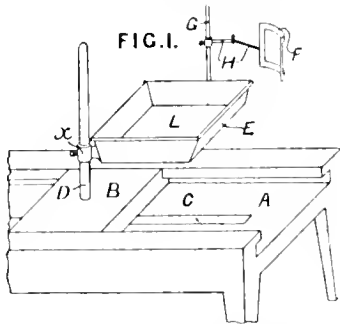


2238. Earle, W. R., and Barnes, E. J. Oct. 3. [*Provisional protection only.*]

Producing photographs of special character; transparencies.—Natural hair is attached to

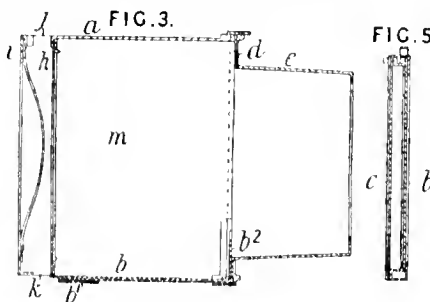
portraits. The hair may be attached in front or behind when the material is transparent or in front when opaque.

2393. Cowper, C., [Pein, J. H.]. Oct. 19.



Ornamenting by photography.—Relates to taking photographs on curved surfaces such as vases, or on uneven surfaces. A stand A fitting into or forming the base of a camera carries a sliding block B on which an upright D is mounted. The rod D is extended below to pass through the slot C, and is provided with a clamping screw. A frame E has a collar x, for adjustment on rod D, and has also an upright G carrying an adjustable articulated arm H to which a mask F is attached. The vase or surface to receive the photograph is secured in a tray L, resting in frame E, by means of clay, putty, &c. so that the face to be ornamented is practically vertical. The view &c. is focussed and adjusted for size, being observed through an opening in the top of the camera. The object is thus removed so as to be sensitized, and is replaced for exposure.

2557. Melhuish, A. J. Nov. 10.



Cameras for single or stereoscopic purposes. The camera is formed of a metal case a, b provided at the back with a frame h and an outer frame i attached to extended side plates so as to leave top and bottom slots j, k. Springs l are provided at each end to press the focussing screen or dark slide up to the frame h. A removable partition m is used in stereoscopic cameras. The front is formed of a plate d having slightly conical removable tubes c so that long or short focus lenses can be used. The front is removable, and is provided with a screw for fixing in position on the inner piece b². Strips b¹ are placed underneath to form a sliding connection with the tripod head. The focussing glass is set in a metal frame provided with a handle.

Dark slides are made double or single. The single form, Fig. 5, has a hinged back c secured by screws, and has a slide b provided with internal stops and locking bolts. In the double form, Fig. 10, two slides are employed which draw out at the bottom, the top having a sliding cover fitting in the grooves a¹ to allow of the insertion and withdrawal of the plates.

2965. Melhuish, A. J. Dec. 28. [Provisional protection only.]

Cameras; dark slides.—The body of the camera and the dark slides are constructed of thin sheet metal properly strengthened by flattened wire or other suitable means. In folding cameras where the joints butt or come together, a strip of metal is soldered to one of the two parts, so as to overlap and cover the joint when in use. Guiding ribs are used when the front and other parts of sheet metal cameras slide together. In some cases the sheet metal front of a camera is hinged to and folds into the interior of a camera. Velvet or cloth (by preference black) is applied to parts where they come or butt together, in order to shut out the light from the interior of a camera. A recess in the frame of the camera receives the dark slide, which is pressed into position by springs. Lap joints connect the sides of the camera. The body of the camera may be formed of an open frame of metal covered with an opaque material. The frame to receive the dark slide may be made distinct from the body of the camera, but is hinged to the bottom, so that it will fold down to allow the body to fold down on it. This frame serves as a support for the body of the camera when in use. Spring handles are applied to the shutters of the dark slides, and the edge of the shutter is bent over the edge of the door when only one shutter is used.

FIG. 10.



A.D. 1860.

- 149. La Ferté, F. J. J. de,** [Garnier, H., partly]. Jan. 20.

Ornamenting by photography.—Relates to the reproduction of photographic and other pictures, engravings, prints, and designs on glass, pottery, &c. A sticky sensitive composition, which hardens when acted on by light, is made of bichromate of ammonia, or other chromium salt, honey, treacle, sugar or other sticky organic substance, distilled water, and albumen. The composition is applied to the plate or article, dried, printed on photographically, and vitreous colour, which adheres to the sticky parts not acted on by the light, is applied by a brush. The picture or design is washed with an acid solution of spirits of wine, dried, washed with an alkaline solution, and fixed by firing. Polychromes are produced by two or more printing-presses and one or more firing operations. Prints on paper are made translucent by waxing the paper.

- 447. Dulos, P. E. S.** Feb. 18.

Photo-mechanical printing.—A printing plate may be produced from a photograph or drawing by spreading a layer of bichromate of potash dissolved in organic substance, or bitumen of Judea dissolved in benzene, on a silvered copper-plate, placing the photograph or drawing over the layer and exposing it to the action of light. The unaffected parts of the layer are dissolved away, thus exposing the silver. A thin coating of copper or iron is then electrolytically deposited on the surface not protected by the coating, and the latter is then removed. The drawing now appears in lines of silver. Mercury is poured over the plate and adheres only to the silver, thus presenting the drawing in raised lines. A plaster or wax cast of the plate is then taken, and an electrotype printing-surface is obtained from the cast. Instead of using mercury, a fusible metal or an amalgam may be poured over the plate. When the metal or amalgam is set, an electrotype printing-surface is obtained from the plate. To obtain a relief plate, a photographic negative is used instead of a positive.

- 543. Asser, E. I.** Feb. 28.

Printing; photo-mechanical printing.—Photographic prints or transfers for lithographic and like printing are made by steeping unsized paper in bichromate of potash, drying in the dark, and exposing to light under a negative. The print is washed to remove the bichromate from the unexposed parts, and dried. It is then wetted on the back and placed on a sheet of unsized paper that has been dampened and stretched over a sheet

of glass or other flat surface, and is then rolled up with printing or lithographic ink. The paper may be coated with starch prior to its immersion in the bichromate solution.

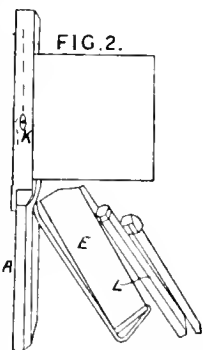
- 559. Swan, H.** Feb. 29.

Cameras, stereoscopic. For taking stereographs in which the two views are of different sizes, a camera is fitted with two lenses of different focal lengths and furnished with separate means of adjustment. Both pictures are taken on one plate.

- 581. Albitas, P. M. T. O. C.** March 2.
[Provisional protection only.]

Cameras; developing.

—A camera is fitted with appliances by which a plate may be lowered into a sensitizing bath, and, after exposure, into a developing bath made of coloured glass. In Fig. 2 the slide holding the plate is connected to the end K of a cord passing over pulleys, and may be lowered by this means into the sensitizing bath A. After exposure, the plate may be developed in the positive bath E placed in the interior of the apparatus, or in the negative bath L, both baths being made of coloured glass.



- 735. Newton, W. E.,** [Rutherford, J. C., and Steele, B. H.]. March 21. [Provisional protection only].

Toning.—A toning solution for prints is composed of a mixture of corrosive sublimate, tartaric acid, sal-soda, hydrochloric acid and distilled water.

- 832. Stelzl, E.** March 31.

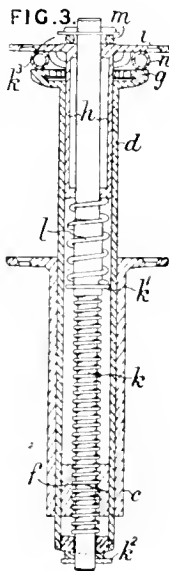
Varnishing.—Photographs on glass may be rendered indestructible by a coating of silicate liquor.

893. Eidlitz, L. April 9. [*Provisional protection only.*]

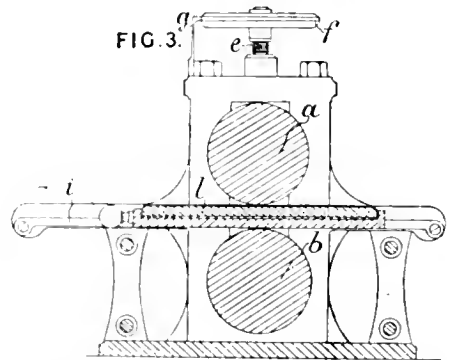
Photo-mechanical printing.—Moulds for electrotype are produced by photographic means. A glass plate is coated with a solution of gelatine and bichromate of potash, and after drying the edges may be coated with varnish. The plate is exposed under a negative, or under an engraving, manuscript, &c., until the surface becomes of a brown colour. It is then placed in cold water to swell the unexposed and partially exposed parts, and is next placed in an aqueous solution of sulphate of copper. After washing and drying on the surface it is metalized by pouring upon it a solution of chloride of gold, and exposing to the fumes of phosphorus. The layer of gold thus obtained renders the surface conducting for electrodeposition thereon of copper or other metal. A cast in wax may be taken from the gelatine surface, and used as a mould for electrotyping.

1035. Minasi, C. April. 25.

Adjustable pedestals.—Music stools, and other seats and stands having a revolving vertical adjustment, are constructed so that the weight supported locks the parts against rotation. Toothed clutch members are provided on plates *i, g* carried respectively by a rotating tube *h* and a sliding tube *d*. The tube *d* is supported at the lower end by a pin and washer *k²* on the adjustment screw *k*. The tube *h* is fitted on the upper squared end of the screw *k*, and retained by a pin or washer *k³*, and is supported by a spring *l* coiled round the screw *k* above the collar *k¹*, so that the clutch members are normally disengaged. The lower end of the screw *k* works freely in a bush in the end of the tube *d*, which slides within a tube *c* attached to the base of the music stool. The nut *f* of the screw *k* is fixed to the tube *c* by lugs, which pass through slots in the tube *d*, and prevent rotation of the tube *d*. The seat is secured to the plate *i*. India-rubber springs or washers *m, u* are arranged between the parts *k³, i, g*, to prevent noise.



pumice, ground flint, and bichromate of ammonia or other soluble chromic salt, the latter body serving to fix the other materials upon exposure to light. A pigment, such as Indian or Venetian red, may also be added. The drawing may be softened by steam or by floating upon water, and the lines may then be supplemented by dusting powdered emery or other material over them. The ink may also consist of white lead ground in turpentine and mixed with size or resinous varnish, a pigment being added if desired; or the drawings may be prepared in a glutinous ink, the lines in each of these cases being supplemented as before. Or an ink may be employed which when dry is hard enough to impress metals. Light may also be allowed to act through the photograph upon a plate coated with bichromate of potash, gum arabic, or gelatine, and a granular powder. The unaffected parts are then dissolved away, leaving a relief image of the photograph. The lines of the image may be supplemented as before. The drawing is impressed on the desired surface in a



machine fitted with a pair of rollers. The drawing may be formed on a plate for the purpose of impressing a soft plate or roller, or it may be placed between two metal plates so as to impress both of them at one operation. The machine contains a pair of rollers *a, b*, the pressure between which may be adjusted by screws *c* connected to the brasses of the upper roller. The screws are operated by graduated hand-wheels *f*, the graduations forming teeth which engage with fixed indices *g*. Or the parallelism of the rollers may be maintained by bevel-wheels on the screws *c* engaging with similar wheels on a cross shaft. The drawing is placed on a horizontal table which is supported by guides *i* and is preferably formed with a recess to receive a glass plate *l*. The plate to be impressed is placed on the drawing, and the table is passed between the rollers, which are geared together and are driven by a hand-actuated worm and worm-wheel. When desired to impress a roller, the roller takes the place of the upper roll of the machine.

1299. Wallis, G. May 25.

Photo-mechanical printing.—Relates to impressing, engraving, and embossing plates and rollers with impressions of engravings and photographs. The photograph is drawn over with a glutinous and granular ink. The ink contains some of all of the following bodies, viz.: Peroxide of tin, peroxide of manganese, Paris white, rice starch, gum arabic, emery powder, powdered

1788. Macaire, L. C. July 21. [*Provisional protection only.*]

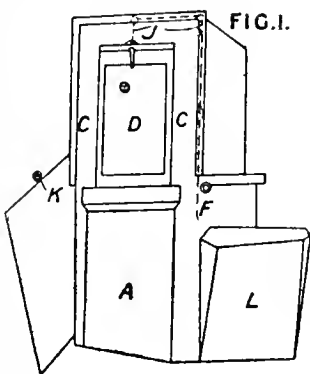
Sensitized plates and films.—A substitute for nitrate of silver particularly applicable to photo-

graphic purposes is produced by mixing pure silver, nitric acid, "azotate" of potash, and zinc or other metal.

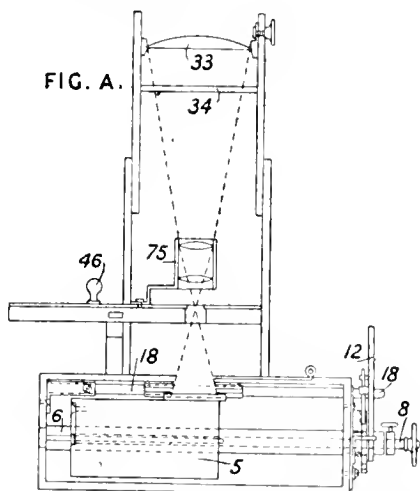
1860. Willcock, J., [*Albites, P. M. T. O. C.*]. July 31.

Cameras; developing; lenses.—

A camera is combined with sensitizing, developing and like baths of coloured glass to enable the photograph to be taken and finished without the use of a dark room. The dark slide containing the prepared plate D is lowered in guides C into the sensitizing bath A by means of a cord F passing over pulleys J. The plate is then raised and exposed, and afterwards lowered into the developing bath L. The light is prevented from penetrating into the apparatus by an india-rubber or like framework K. To increase the effect of the light on the plate, additional light is admitted by a lateral aperture in the lens combined with a mirror which reflects the light on to the plate. The lateral hole may be made in the side of the camera.



1922. Flounders, C. F. Aug. 8.

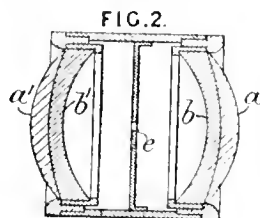


Printing; reducing.—Relates to an automatic printing apparatus in which the printing paper or the like is mounted on a roller, and the light is condensed on the negative by a lens. By placing an objective lens between the negative and the printing paper, prints of reduced size may be

produced. In the form of the apparatus shown in Fig. A, the light is condensed on the negative 34 by the lens 33, and the image of the illuminated negative is thrown by the lens 75 upon the printing paper on the roller 5, which may be polygonal. The exposure is made by an instantaneous spring disc shutter set and released by the knob 46. After an exposure the roller is turned by the lever 12 acting through ratchet gear on the roller shaft 6, the roller being displaced longitudinally by the rod 8 at the end of each revolution. When the lens 75 is dispensed with, the negative is placed in a frame pivoted on the axis 18, so that it is lifted off the paper, after an exposure, by the action of the lever 12, on a crank on the axis 18.

2496. Brooman, R. A., [*Harrison, C. C.*]. Oct. 13.

Lenses.—A wide angle lens is formed of a symmetrical pair of achromatic meniscus lenses *a, b* and *a', b'*, the outer surfaces of *a* and *a'* forming portions of a sphere having its centre at *e*.



2639. Knight, J. A., [*Korn, C. F.*]. Oct. 29. [*Provisional protection only.*]

Lenses and lens fittings.—An objective with two lenses for taking portraits is converted into a landscape lens by unscrewing the front lens, inverting it, and screwing it on the camera instead of the double lens.

2772. Williams, V. V. Nov. 13. [*Provisional protection only.*]

Tripod and like stands.—A collapsible camera, telescope or other instrument stand, which may be closed up as a walking stick, consists of an outer tube, split into three legs, which are jointed to a tubular socket at the top, and have specially-shaped shoulders at the bottom to prevent the points penetrating too far into the ground. A tube, terminating at its lower end either in a tapering screw or a vulcanized rubber cap, passes through the socket, and forms a fourth or central leg, controlled in position by a thumb-screw through the socket. Another tube, provided with circular notches, works inside the above-mentioned fourth leg, and may be fixed at any height by a spring working in the notches and controlled by a thumbscrew in a collar at the top of the fourth leg. When used for a camera, four hinged sectors or ribs of hard wood, the inner angles of which have been removed, are fitted to the top of the notched tube, and when folded outwards they form a table on which the camera may be secured by an elastic band. If used as a telescope or other stand, the table top is not required, modifications being made in the

top to fit telescopes of various diameters and descriptions. When closed, the whole is provided with a waterproof alpaca or oil silk cover, and a knob or cap.

2832. Macfarlane, H. Nov. 17. [*Provisional protection only.*]

Cameras.—The back of a camera has an inner shell entered loosely a short distance and attached by a single screw or pin at the top, and another at the bottom, so that the back can be inclined slightly in either direction about a vertical axis. The back of the box can be fixed at any inclination by means of a screw working in connection with the guide in the back supporting flap. A slight inclination about a horizontal axis is obtained by means of a pair of levers inside the box, against which levers the frame for holding the picture plate bears, these levers being inclined by means of pins projecting through slots to the outside, and being fixed by means of external screw nuts.

2881. Dalglish, A. A. Nov. 21.

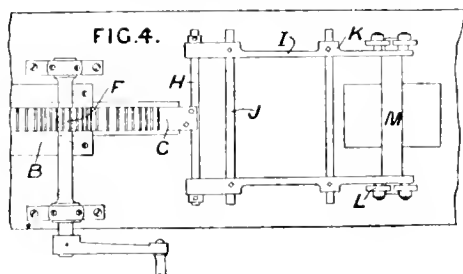


Photo-mechanical printing.—Designs are formed upon rollers, mills, plates, &c., of steel, copper, wood, &c. by means of photography, and are transferred to larger rollers or plates used for printing calico, paper, or other textile fabrics, and also to surfaces of copper, steel, wood, &c., for engraving or wood-cutting. The design is photographed on glass, paper, leather, cloth, &c., and the film transferred to the roller or other surface by means of a sheet of gummed paper which is then removed by immersing it in water; or the roller, which has been coated with an etching varnish, is passed over the film, which adheres to it. In preparing rollers for calico-printing, the apparatus shown in Fig. 4 may be used for transferring the film. A rack *e* is caused to slide in guides *B* by a pinion *F*. The end of the rack is attached to a cross-bar *H* of an open frame consisting of two bars *I* whose distance apart is adjusted by bars *J* and screws *K*. Each side piece *I* carries two antifriction rollers *L* which rest on the journals of a varnished roller *M* resting upon the photographic film. As the rack traverses, the film is transferred to the roller *M*. The design is then etched with acid or engraved either in relief or intaglio upon the roller. To transfer to the large roller or plate, the design on the small roller is filled with varnish, or the

large roller is covered with varnish, and the design is impressed upon it. The design is then etched on the surface with acid. The plate may also be coated with gutta-percha or other varnish, and with collodion, and the photograph taken direct upon it. When there are several colours in a design, a photograph is transferred to a die, and the outlines of all the colours are etched or engraved through the film. From this die, an impression in white or other colour is put upon as many dies as there are colours to be printed, the surfaces of the dies having been previously varnished. The outlines of the separate colours are then etched on their respective dies, the varnish is removed and the dies coated with varnish up to the etched outline. The dies are etched with acid, and from them are prepared the mills for engraving the printing rollers. In a modification, the photograph is put on the die and the outlines of all the colours etched. A mill is made from this die which is caused to impress the surfaces of the dies slightly for the separate colours. The outlines not required are then erased. In another method a photograph is taken for each colour and transferred to a separate die. Large designs may be photographed in sections, the films being placed together on the varnished roller or plate. Photographs may be transferred by the means described, to any metal used in or preparatory to the printing of paper, the outlines being engraved or etched on the metal; the metal is revarnished and the shading then etched or engraved.

2913. Beatty, F. S., and Alexander, T. Nov. 27.

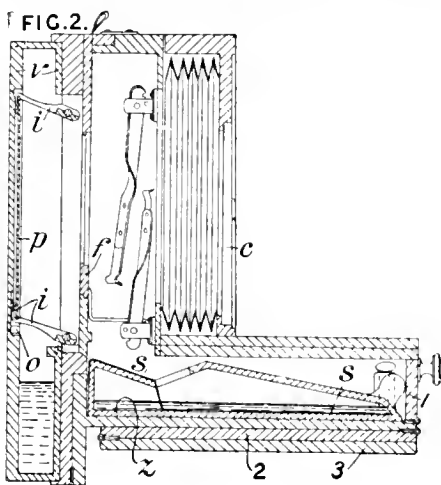
Photo-mechanical printing.—Relates to the preparation of printing surfaces for block, intaglio or colour printing, and also to the preparation of the transfer and the method of transfer to stone or metal for lithographic printing from photographic negatives or positives. The photographic print which is to form the transfer is prepared on paper, metal foil, vegetable parchment, or paper impregnated with india-rubber, asphalt, or caoutchouc. The paper is coated with any ordinary transfer medium, and is hot pressed or calendered to produce a glossy or glazed surface. For fine shading a grain is produced by adding finely ground emery, peroxide of iron, glass, or flint. The transfer medium preferably used consists of isinglass, arrowroot, gum tragacanth, flake white, chalk and gamboge. The following may also be used:—Gelatine, size, dextrin in solution, arrowroot, wheat, barley, and rice flours made into a jelly paste, to which may be added flake white and gamboge, lucine, or vegetable or animal albumen either alone or covered with the transfer medium. The paper is sensitized with a solution of potassium bichromate mixed with one or more of the following, viz.:—Isinglass, gelatine, dextrine, albumen, and gum arabic. The paper is floated on the sensitizing solution more than once if desired, and is dried and pressed or calendered if necessary. A print is made from the negative or reversed negative, and a grain is imparted to the printed surface by placing it in a press with an engraved

or ruled plate, having a mezzotint or aquatint ground, which has been inked and cleaned. The prepared print is placed in a zinc tray containing water in which gum arabic is dissolved, and is heated. The plate is then placed face downwards in cooler water, when the portions not acted upon are removed, leaving the print in transfer ink. The grain may be imposed on the paper before printing. Grained stones or metal plates prepared with lithographic chalk may also be used, or the print may be put down on to an aquatint ground prepared from resin dissolved in spirits of wine. Line subjects may be prepared on a fine grain plate; thinned ink being applied with a dabber. Colour printing is obtained by making separate prints for each colour, the parts being marked with gum, water and lampblack or by other means. The prints are transferred to a series of stones from which the combined result is obtained. For preparing blocks for surface or intaglio printing, a thicker and stronger sensitive coating is employed, the exposed print being washed in cool water which is gradually warmed, a little nitric acid being used; the print being gently brushed. When dry a cast is made in plaster of Paris containing washed chalk. An electrotype is taken from the cast, or the cast may be hardened with silex, "silicate zopissa" or aluminate of potash to prepare for printing proofs. If a print is to be made direct on to a metal plate (preferably zinc) the negative is first prepared by exposing the back of the sensitive plate to the camera lens. After printing on the sensitized metal plate an acid-resisting varnish is applied. The plate is then washed and treated with acid, which may be assisted by electric action, the required printing surface being then obtained in relief. If an intaglio printing surface is required the print is made from a positive. The print may also be made on any hard surface, such as glass, marble, lithographic stone or iron, &c. After inking up, a transfer may be obtained that can be put down on to a stone or metal plate for further printing.

3024. Clark, W., [Anthoni, C. G.] Dec. 10.

Cameras; sensitized plates; developing; washing; lifters, plate and like.—The baths for sensitizing and developing the plate are combined with the camera, so that a photograph can be taken without a dark room. The camera may be stereoscopic. The collodion-coated plate *p* is held on pivoted hooks *i*, and by tilting the trough *v* on its hinges

the plate is immersed in nitrate of silver solution. After an exposure made by raising the shutter *f* and uncapping the lens, the plate *p* is disengaged from the hooks *i* by lowering it down till it rests on the block *o*. By inclining the apparatus, the plate is dropped into the sulphate of iron developing bath *z*. After development, the developing-dish with the plate is withdrawn through the



door 1, and the plate is lifted from the bath by the hook *s*. Rocking motion is imparted to the bath by means of hinged board 2, 3. The plates are washed by placing them in a grooved box full of water. For stereoscopic pictures, an adjustable partition is used in the camera, and the lens is displaced by rotating an eccentric lens board *c*. For focussing, the plate *p* is replaced by a ground glass.

3181. Pallu, C. Dec. 28. [Provisional protection only.]

Sensitized plates and films; dishes.—The plate or the like ready for sensitizing is placed in a case with a sliding lid. The sensitizing bath is contained in a gutta-percha dish also with a sliding lid. To transfer the plate from the casing to the bath, the lid of the latter is removed, and the case placed above it. The lid of the case is then removed, and the plate thereupon falls into the bath. After sensitizing, the plate is lifted back into the case by a silver wire, and is transferred to the camera from the case.

A.D. 1861.

- 508. Henry, M.,** [*Tournachou, (called Nadar), G. F.*]. Feb. 27. [*Provisional protection only.*]

Printing.—Electric light or gaslight is combined with Moitessier's mode of obtaining positives. A separate room for preparing and developing the plate may be dispensed with as the circumscribed rays of the reflector on the objectivity can be directed. Instead of frames two dark chambers may be used, in one of which are placed the negative plates, or stereotype plates, or clichés, and in the other chamber are placed the glasses treated with collodion intended for the reproduction of the positive stereotype or cliché. The two dark chambers are placed opposite one another, and the space between them is kept dark by a covering; the chambers can be brought mutually nearer or further according to the sizes to be produced; the light is placed in front of the first dark chamber and concentrated by a reflector on the negative plate, stereotype plate, or cliché.

- 852. Knight, J.** April 6. [*Provisional protection only.*]

Trays and dishes.—Baths, trays, and other vessels for photographic use, also for galvanic batteries, and other vessels to contain chemical solutions, are made by coating a thin layer of gutta-percha or india-rubber, or compounds thereof, with layers of paper or other fabric united by solutions of india-rubber, gutta-percha, shellac, or the like.

- 955. Brooman, R. A.,** [*Fargier, A., and Charavet, N.*]. April 18.

Chromo-gelatine processes; printing.—A plate of glass is coated with a mixture of bichromatized gelatine, lampblack, charcoal dust or the like. After printing from the negative, which is in contact with the gelatine film, the gelatine is coated with a layer of collodion, detached from the glass in hot water, and the picture developed by washing. The picture is mounted on gelatinized paper, and the collodion dissolved off. In a modification, the gelatine coating is supported on thin paper through which the print from the negative is impressed, no transfer of the film being necessary in this case. In another modification a layer of non-carbonated gelatine is first poured on the glass plate and over this the carbonated gelatine. This facilitates detachment of the film after printing.

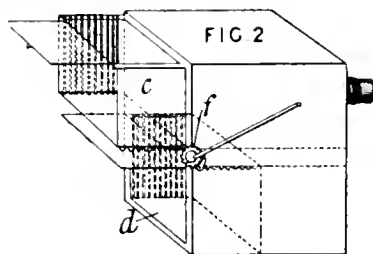
- 1074. Dixon, H.** April 29. [*Provisional protection only.*]

Sensitized plates and films.—Nitrate of silver is mixed with collodion or other coating medium before it is poured on the plate, thus dispensing with the sensitizing bath.

- 1089. Hooman, T., and Maliszewski, J.** May 1.

Ornamenting by photography.—The interior of any glass or other transparent vessel is ornamented by photography, by coating the interior of the vessel with sensitized collodion and printing thereon from flexible negatives of waxed paper or mica. The part of the vessel not covered by negatives is covered by gutta-percha.

- 1457. Du Mont, H.** June 8.



Cameras; change-boxes; shutters.—Relates to photographic apparatus for reproducing the successive phases and shiftings of a moving person, body, &c. A succession of sensitive surfaces succeeding each other at regulated intervals are exposed to light at regulated intervals, by means of a shutter when the plane of the sensitive layer is perpendicular to the axis of the ray. The sensitive surfaces may be mounted on a prismatic drum caused to revolve so that the sensitive layers "succeed each other in the focal" plane. Another means of obtaining the quick succession of the sensitive layers is to place them together side by side in a dark slide moving intermittently in its groove, vertically or horizontally. A third method of accomplishing the said object is to set the sensitive layers one behind the other in a long box *c* with vertical grooves, and moving in a contrary direction to a similar box *d* situated under it, and intended to receive the layers after exposure. A ratchet wheel *f* and ratchet movement enable the sensitive layers to fall into the lower box as they are exposed. The exposure of the sensitive layers to light at the proper instant is accom-

plished by means of a shutter, the regulated motions of which are connected with the motions of the systems bearing the sensitive layers. The shutter may be formed as a screen having a rotary or oscillating movement, and when rotating may be mounted on a cylinder or prism either forming part of the said cylinder &c. or projecting at right angles therefrom. The pictures taken may be single or stereoscopic.

1855. Neville, H. July 24. [*Provisional protection only.*]

Cameras.—A camera for producing minute photographs is fitted at one end with telescopic tubes for coarse and fine adjustment, and is furnished with a microscope opposite the focal plane to facilitate focussing.

1936. Lewis, J. Aug. 3.

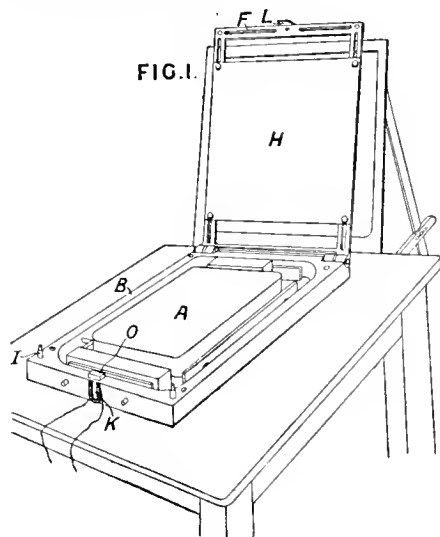
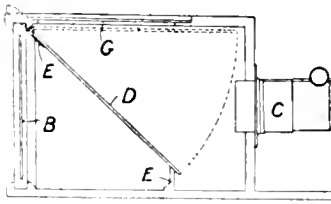


Photo-mechanical printing; cameras; producing coloured photographs; intensifying; sensitized plates and films.—In preparing lithographic and other printing surfaces, the design is obtained upon an altered scale by the use of an elastic transfer consisting of a thin sheet of gutta-percha, parchment dust or pulp, or india-rubber. The gutta-percha &c. is employed without any surface preparation. The material is stretched and then cemented to a stiff backing of cardboard, paper, or india-rubber. The design is then produced on the sheet by photography, transferring, or otherwise, in transfer ink or its equivalent, and the sheet is heated to release it from its backing, when it contracts and gives the design on a reduced scale. The design is then transferred to stone, metal, plate, paper, glass, wood, or other surface for etching, printing, and for figuring or ornamenting china, porcelain, pottery, and other surfaces. The gutta-percha or other

sheet is softened by hot water, and may be extended by drawing-rollers, or may be placed, either alone or secured to an india-rubber sheet, in a stretching appliance. The elastic medium may be employed for colouring photographs, the colour being applied, and the medium afterwards relaxed to its original size. To transfer photographs, the stone or surface A is coated with a sensitive mixture, preferably a composition of oil of lavender and asphaltum, and the negative is held firmly in a frame B. A hinged frame F folds over the stone A and fits over taper pins I on the frame B. A raised block O on the frame B carries a device of cross lines and dots, and a transparent disc in an opening of the frame F carries a similar device so that exact registration may be secured. An electromagnet K may also be secured to the block B, its wires being cut off flush with the surface. A connecting wire in the frame F also has its ends flush with the surface. When the two frames are in exact registration, the circuit is completed, and the armature L on the frame F is held by the magnet, thus keeping the frames in position. Several hinged frames may be employed, each being fitted with a registration device. In another arrangement, a revolving bed-plate carries a series of surfaces which may be successively brought under the hinged frame. A design is printed on the hinged surface and transferred to each of the other surfaces. They are then all transferred back to the hinged surface, thereby augmenting the elevation of the design. In a cylindrical modification, the receiving surface is carried by a revolving cylinder and the transmitting surface by a reciprocating table underneath the cylinder. The table is mounted on rollers having A-shaped grooves which fit on similarly shaped rails. Flanges on the ends of the cylinder also work in grooves in the table. These registering frames are applicable to the production of etchings, photographs, photo-lithographs, printing surfaces and to photo-printing. The photograph is fastened into the register frame and shnt down on the sensitive surface and exposed to light. After a time the light is shut off and the surface of the plate washed with turpentine and carbon bisulphid or other solvent. The coatings, exposures, and fixings are repeated until a perfectly developed copy is produced, any desired portions being stopped out by opaque powder which may be subsequently brushed off. For the last fixing, oil and gum are added to the solvent. The work is finally coated with a solution of soluble silicates or gum and acid preparation, and allowed to stand before printing. Bichromate of potash or ammonia combined with glutinous matter is sometimes used as a sensitive agent. The work may be bronzed or dusted with silver powder or plumbago, and electrotyped. The work may be produced on an elastic medium which is afterwards allowed to contract so as to produce the design in greater elevation. The register frame may be applied in combination with the daguerrotype process, silver powder being spread over the inked surface, which is then planished and sensitized like a silver plate. The first exposure secures the broad lights, the next the middle tints, and the last the detail. Sensitive salts of silver in the form of powder may be em-

ployed instead of silver powder. To produce a surface printing plate for lithographic, transferring, embossing, or printing purposes, a flat plate or surface is coated with white lead, chalk, white clay, or other substance mixed with gum to the consistency of cream. It is then placed in the register frame and coated with a sensitive mixture. After being exposed, the surface is washed with solvent, and the unprotected portions of the surface brushed away. These operations are repeated as desired, and the surface eventually used to obtain a stereotype or an electrotpe. The work, when complete, is soaked in a jelly of isinglass, white of egg, spirit varnish, or other agent which will strengthen the work without injuring the sharpness of the lines or filling up crevices. For obtaining a raised photographic surface in a camera, the box of the camera is much larger than usual and has an opening in the bottom through which slides a glass jar containing liquid for sensitizing the plate. The first picture is taken as usual and developed, the plate is washed, a second coating of collodion is applied, the jar is then raised to sensitize the plate, and a second exposure is made, these processes being repeated as desired.

2073. Sutton, T. Aug. 20.



Cameras; shutters.—A camera is fitted with a pivoted reflector which throws the image on a focussing glass on the top of the camera and also acts as a shutter. The camera may be used for taking instantaneous photographs, and is mounted on a ball-and-socket joint. The reflector D is pivoted at E, and when in the position shown

throws the image formed by the lens C on to the focussing plate G. When the reflector is raised, the image falls on the photographic plate B.

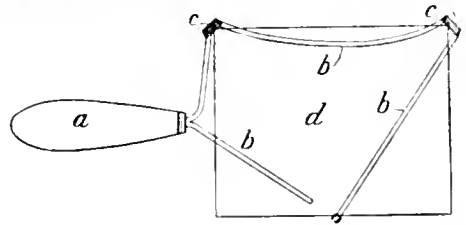
2434. George, B. G. Sept. 30.

Mounting prints to prevent buckling. The print is secured by a suitable cement to a slab of plaster of Paris, papier mâché &c. formed in a mould with or without an ornamental border or framing or in relief. The ornamental portions representing the frame &c. may be gilded or painted. The print may be mounted upon the smooth or other part of the cast and may be covered with varnish, gelatine, glass, or other preservative material. Reference is made to Specification No. 3004, A.D. 1860, [Abridgment Class Printing other than letterpress &c.].

2924. Polyblank, G. H. Nov. 21. [Letters Patent void for want of Final Specification.]

Varnishing.—Photographic and other prints are preserved from injury and decay by coating them with melted paraffin, with or without a preliminary sizing.

3147. Debenham, W. E. Dec. 14. [Provisional protection only.]



Holders, plate and like.—A holder for plates undergoing chemical treatment consists of a bent wire with a handle and guards to support the corners and edge of the plate. The bent wire b is furnished with a handle a, and guards c support the plate d.

A.D. 1862.

86. Wilkinson, W. Jan. 11. [*Provisional protection only.*]

Mounting prints and the like.—The print is placed on glass, and its face is brushed with a transparent cement. A second sheet of glass is brushed over on one side with linseed oil, the aforesaid design is removed to it and its back is brushed with linseed or olive oil. The margin of each sheet of glass is then coated with a strong opaque paint, and this when dry is coated with a cement by which the two sheets are connected together. Instead of using two glass plates, the back of the design may be protected by a water-proof varnish or cement, or it may be silvered or covered with tin plate and then painted. The invention is applicable to buttons and jewellery and also to pictures, windows, window blinds, panels for rooms, doors, ceilings, cornices, cornice poles, fire screens, mantel pieces and floors, by fixing the ornamented glass in metal or wood frames. For pictures and panels the back glass may be coated with an opaque paint.

640. Brooman, R. A., [*Morvan, A. G.*] March 10.

Photo-mechanical printing; copying documents.—Relates to the production by the aid of photography of copies of maps, charts, plans and drawings. A tracing of the design, on transparent drawing cloth, is placed in contact with sensitized paper, or other surface, the face of the design being next to the sensitive surface; the frame containing this arrangement is exposed to the action of light, and the image is fixed and finished in the usual manner. The sensitizing solution described in the Provisional Specification contains iodide of silver, that set forth in the final Specification contains "azotate" of silver. Positive prints made from this negative may be made on albumenized or salted paper. To obtain the design, upon the paper or transparent cloth, on stone, the stone is prepared with acid, washed in water, dried, coated with a sensitive varnish, allowed to dry, and exposed under the paper or cloth negative to the action of light. The stone is then washed with white wine, with water, allowed to dry, washed with soapy water, again washed, and then dried in a stove or otherwise. Ink is then applied; the stone is allowed to rest 24 hours, and washed with essence of turpentine. Ink is again applied, and the subsequent inking operations are facilitated with phosphoric acid and gum, so as to bring out the design; impressions may then be taken from the stone. By this process the stone gives positive impressions. The varnish contains white of egg and bichromate of ammonium, and those parts exposed to light become more or less insoluble. The ink first used

contains transfer ink in which lithographic crayon is ground up; that employed the second time consists of transfer ink and phosphoric acid.

677. Grisdale, J. E. March 12. [*Provisional protection only.*]

Cameras; lens fittings; dark slides.—The two ends of the camera are connected together on the four sides by lazy-tongs levers, which are braced together by metal braces which pass round and enclose them. The whole may be covered by the ordinary bellows covering or by a bag. The lens tube is secured in front of the camera by three or more pairs of hinged radial flaps or arms. Two pairs are inside and one pair outside the camera, so as to approach and hold the lens by means of two rings on the lens tube. One of the rings is adjustable by the hood. The dark side has a peculiar hinged cover in lieu of the ordinary sliding cover. The improved cover made in four parts is arranged so that each part will fold back inside the camera, the divisions in the cover being so disposed as to admit of each part folding back into a tapered camera when required to do so.

681. Fontaine, F. H. March 13. [*Provisional protection only.*]

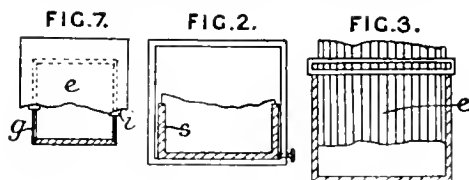
Photo-mechanical printing.—Relates to the reproduction of photographs, drawings, paintings and engravings, by means of copper plates. A zinc plate coated with gelatine and bichromate is exposed under a glass or paper negative of the design, developed to produce a relief, and an impression or mould taken from it by first coating it with dissolved rubber and then fixing a sheet of rubber mixed with oil to the coating, by heat and pressure. From this mould an electrotpe in copper is obtained. By another method a copper plate, coated with gelatine gum and bichromate, is exposed under a glass or paper positive of the design, and is then treated with a saturated solution of perchloride of iron, and afterwards with a weaker solution, to develop and etch the copper plate.

948. Mann, A. April 3.

Shutters.—An instantaneous shutter consists of two plates sliding in a frame under the action of elastic bands, and connected by a cord passed round a guide so that they move equally in opposite directions. Each plate has a rectangular aperture, arranged so that the shutter opens from the axis of the lens. The plates may be held by a small spring before the exposure; or the shutter may be opened by pulling a cord, in opposition to

the elastic bands. To save space, the plates may be replaced by soft leather, which doubles up in the frame. The shutter may be placed before, between, or behind the lenses, and may have apertures for several lenses.

Cameras; masks; lens fittings.—A shade is provided to cut off the sky during part of an exposure, in order that clouds may be photographed on the same negative as a landscape. In one form, an open frame *s*, Fig. 2, provided with a groove and spring clips to hold a sheet of paper, is hinged within the back of the camera, and can be turned down by a cord or a milled head. When the view is focussed, the horizon line is marked on the focussing screen with a mixture of ink and honey or other deliquescent substance, and transferred to a sheet of dark paper, which is then cut to the line and placed in the frame *s*, as shown in Fig. 2. The line may otherwise be drawn on thin paper applied to the focussing screen. In another arrangement, a box is placed on the front of the lens, and provided with two rings *i*, Fig. 7, movable stiffly on vertical rods *g* at its front end, to support a paper screen *e*, cut as described. This box may carry the shutter, described above.



In place of paper screens, a frame may hold a number of vertical strips of wood or other material, Fig. 3, either in the camera or on the lens box, so that the strips can be slid up or down by hand, to fit the horizon line. To exclude all light, the strips may be of angular or curved section; or two rows of flat strips may be used, each strip overlapping two others. The Provisional Specification describes the use of a blind in the camera, to be drawn down gradually by a cord or spring, for giving increased exposure to the foreground. In order to photograph an extended landscape, the Provisional Specification states that the lens may be turned about a centre, the plate moved correspondingly by a connecting rod, aided by a semicircular train and rollers, the whole being actuated by an adjusting screw and toothed or other gearing.

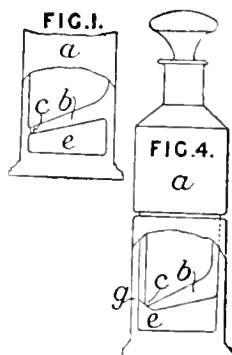
Finishing paper prints. The Provisional Specification states that a hollow sliding table, for hot-pressing, may be heated by gas-jets, supplied by a flexible tube; the temperature of the table is regulated by the expansion of mercury, contained in the table, moving a piston and lever to turn the gas-supply cock.

1042. Garnett, J. April 11. [Provisional protection only.]

Washing.—The prints or pictures to be washed are deposited in a shallow, partitioned box, having perforations at the top and bottom, and a handle, or other suitable device, by which a vertical motion is given to the box in a reservoir of water.

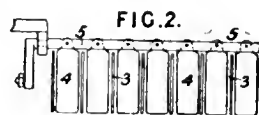
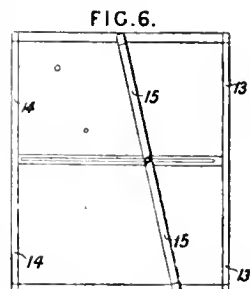
1058. Drewett, E. April 12.

Trays and dishes.—The invention is mainly described as applied to bottles and jars, but is also applicable to photographic baths, and is designed to facilitate decantation and the separation of sediment from the contents. The vessel *a* is formed with an inclined false bottom *b* having an orifice *c* at its lower side through which sediment passes into a chamber *e*. By tilting the vessel so that the orifice *c* lies along the upper line, the liquid may be poured out clear. In a modification the actual bottom *b*, Fig. 4, of the vessel *a*, is made sloping and with an orifice *c*, and the vessel *a* is made to fit tightly into a separate removable vessel *g* leaving a space *e* in which the sediment collects.



1222. McLachlan, L. April 25.

Lighting arrangements; studio accessories.—A double arrangement of slats is used to regulate the top and side lighting of studios, and a variable background is used consisting of screens of gauze with a backing of black velvet. Fig. 2 is a section of the arrangement as applied to the roof. A series of fixed longitudinal slats 3, are so placed as always to exclude direct sunlight, and between them is a series of rows of partitions 4 fixed or centred on the cross-bars 5 provided with cranks and bearings. The side lights are regulated in the same way, but in addition the longitudinal slats also are pivoted, and the small partitions are centered on the cross-bars, to allow of their accommodation. The background consists of a framework shown in plan in Fig. 6, with a screen of gauze or other partially transparent material stretched over the front 13, one of black velvet over the back 14, and another of gauze over an adjustable frame 15.



1453. Brooman, R. A., [Farrenc, L.] May 14. Drawings to Specification.

Lenses; producing distorted photographs.—Two convergent cylindrical lenses are used in

combination with other ordinary magnifying lenses for producing distorted photographs of objects, either as ordinary or stereoscopic pictures. It is stated that two stereoscopic prints will remain stereoscopic after the distortion.

1516. Morris, T., Weare, R., and Monckton, E. H. C. May 19.

Lamps, actinic.—For use in photographic work, an arc light is produced by a spark discharge from some form of static machine or an induction coil suitably excited.

1712. Haseltine, G., [Wilson, A. B.], June 7.

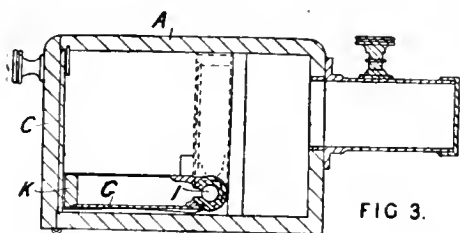


FIG. 3.

Cameras; holders, plate; trays and dishes; developing.—A camera A is provided with a hard rubber frame K on pivots I, to hold a collodionized plate G while it is sensitized, exposed, and developed, no dark room being required. The plate is held against rubber packing on the frame K by a spring and snap; a focussing screen may be held similarly. One pivot is provided with a handle for turning the frame K from the position shown, in which it serves as a dish, to the vertical position for focussing or exposure. The other pivot I is hollow, and has a funnel attached outside, at an angle to exclude light, serving to receive or discharge the silver bath and developing solution. Two passages may be provided in the pivot, and two funnels, to avoid washing out after development. The back of the camera is closed by a door C. Another arrangement is mentioned, in which the frame is used in the vertical position as a bath, being closed in front with a liquid-tight slide, and tubes being provided to supply and discharge the solutions.

1724. Smith, W., [Lissagaray, H.], June 10. [Provisional protection only.]

Masks; printing.—Backgrounds, borderings, and such like ornamentation for photographs, are produced during the printing process by employing one or more masks, each consisting of a sheet of transparent material, on which are electrically deposited films of gold and platinum in succession. An ornamental design is then engraved on the metal, so that light may pass through the lines so made.

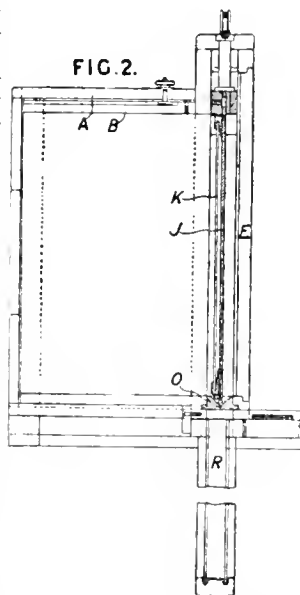
1888. Brooman, R. A., [Dupuy, J. T.], June 27.

Printing-paper; colouring; ornamenting by photography.—Paper which has been gelatinized, albumenized, or the like, is coated with ammoniacal citrate of iron, and bichromate of potash, printed on, and after the picture is finished it is coated with transfer varnish and applied to wood, porcelain or other surfaces. The backing paper is then rubbed off. The print before treatment may be coloured, or dusted with gold, silver, or other metallic powder. Mineral colours are used when the image is to be fired. The image may be developed in a solution of iron or pyrogallie acid, and fixed with potassium hyposulphite or cyanide.

1962. Gruner, C. B. July 8.

Cameras; sensitized plates; developing; fixing.—

The plate is sensitized, and after exposure, developed and fixed by lowering it from the camera into baths placed below the base of the camera. In the wet process, the plate K after being coated with collodion is clamped in a sliding frame J at the back of the camera. To sensitize this plate a sliding cover O is pulled back, and the plate is lowered into a sensitizing bath R, the sides of which are made of non-actinic glass. In the meantime, a door E is opened, a focussing screen is placed in plane of the plate K and focussing is effected by sliding the box B in the box A. The focussing-screen is then removed, and the plate K is raised into the focal plane. After exposure, the sensitizing-bath is replaced by developing and fixing baths, &c., and the plate is developed, fixed, &c., in the manner above described. Dry plates may be used in this apparatus, the sensitizing bath being then unnecessary.

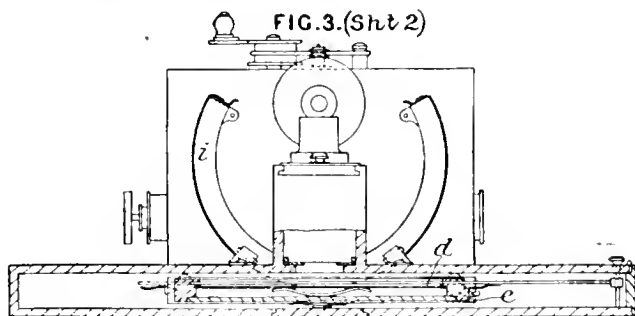


1988. Ponti, J., [Ponti, C.], July 10.

Producing transparencies and photographs of special character.—Photographic slides for use with a graphoscope are printed on translucent paper so that they can be examined either by reflected or transmitted light. A sheet of coloured transparent paper may be used for tinting purposes.

2459. Johnson, J. R., and Harrison, J. A. Sept. 5.

Cameras.—Relates to a panoramic camera in which the sensitive plate is flat and is traversed in a direction opposite to the direction of rotation of the lens. A plan of one form of the apparatus is shown in Fig. 3. The sensitive plate *d* is mounted in a dark slide *e* which is traversed by a cord passing round a disc *i* fixed to the base of the camera support, the movement being imparted when the camera is rotated about a vertical axis passing through the centre of the lens. The camera may be rotated by hand, or by a spring or a weight. The movement is rendered uniform by a flywheel, rotating vanes, a dash-pot or other suitable device. A diaphragm is used in the lens, consisting of two oppositely-sliding plates with diamond apertures.



A diaphragm is placed between the lens and the sensitive plate, the aperture of which is adjustable so as to give wider opening to landscape than to sky.

2582. Dixey, L., and Smith, G. Sept. 20.

Embossing photographs; colouring; producing photographs with a corrugated surface.—Photographic prints are tinted by lithographic printing and their surfaces are rendered corrugated or matted by pressing the damp print between twill or other fabric. A print, without background, is obtained by suitably blocking the negative with opaque paper, and is then fixed, toned and washed as usual. A tracing of the outline of the photograph is then made, cut out and attached to the print, so that on printing the desired colour by a lithographic stone, only the background will be coloured. The tracing-paper is then removed, and the whole of the print may then be printed in another tint.

photograph on glass or paper is fixed on it, all the previous operations being performed in the dark, and the stone is then exposed to light of suitable intensity for a suitable time. After the positive has been carefully removed in the dark chamber, a solution of potash is allowed to act on the plate for a minute or more, and forms a slight engraving by destroying the bichromatized gum coat where it has not been acted upon by the light. The stone is then sponged with fatty matter such as soapsuds, which are caused to enter the engraving, after which the stone is wiped and dried, acidulated and gummed, and then washed after a quarter of an hour in clear water. It is then again gummed, when it may be used for ordinary lithographic printing after resting for a quarter of an hour or more. Zinc plates may also be prepared by this method.

2598. Brooman, R. A., [*Lafarge, J. J. L. R. de*]. Sept. 23. [*Provisional protection only.*]

Trays and dishes; developing; sensitized plates and films.—A frame contains two vertical vessels, arranged to allow the plates to be readily plunged therein; one vessel, containing the silver solution for sensitizing the damp collodion, is made of rubber or the like, and the other, containing the iron solution for developing, is made of yellow or orange-coloured glass. A second frame supports the plate in either of the vessels. In this way, the operations may be performed in daylight.

2892. Placet, P. E. Oct. 27.

Photo-mechanical printing.—In preparing or "engraving" an electrotpe for photo-mechanical printing a fairly thick coat of Judea bitumen, or vegetable or animal substance which becomes insoluble under the action of luminous rays, or bichromate of potash mixed with gum, dextrine, or other organic matter, is mixed with quartz sand or other fine inert powder, and spread on a glass plate, and exposed to the action of light under a plate carrying the design to be engraved. The glass plate is then covered with a coating of gelatine or other agglutinous and inert body, which may be strengthened by making a sheet of paper, textile fabric, or other material, adhere to it before being dried. The whole is then plunged into a mixture of naphtha and benzene, which dissolves the parts of the original surface not acted on by light, the remainder leaving the glass plate and sticking to the gelatine. From a mould of this surface in relief, an engraved plate for use in copperplate printing or, in some cases, typographic printing, may be prepared by the galvanoplastic or electrotpe process.

2820. Brooman, R. A., [*Marquier, F. L.*]. Oct. 20. [*Provisional protection only.*]

Photo-mechanical printing.—When reproducing photographic designs or prints on lithographic stones the stone after being grained has a saturated solution of bichromate and gum arabic spread equally over its surface and rubbed to dryness with a clean rag, after which a transparent positive

2906. Sutton, T. Oct. 28.

Printing-paper.—Before applying albumen the paper is waterproofed by soaking in a solution of india-rubber or gutta-percha in any suitable solvent.

2997. Newton, A. V., [Schulze, P., and Billing, F. W.]. Nov. 5.

Negatives, producing by drawing and coating.—A substitute for a photographic negative is prepared as follows:—A plate of finely-ground glass is coated with an alcoholic solution of shellac, and a drawing is made upon it in ink soluble in water, such as a mixture of an aqueous solution of gum arabic, sugar, and lampblack, ivory black, or other colouring-matter, or of glue water and colouring-matter. The surface is then coated with a composition containing beeswax, asphaltum, resin, fine lampblack, and thin varnish or linseed oil. The coated plate is then soaked in water, and the ink is washed out in a stream of water. Finally, lampblack is dusted over the surface and a coat of alcoholic varnish is applied.

3247. Eden, A. F. Dec. 3.

FIG. 1.

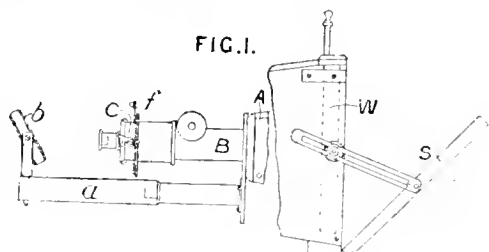
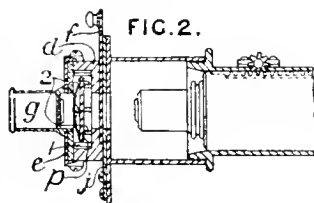


Photo-micrography.—Relates to apparatus for producing micro-photographs of large objects and large photographs of microscopic objects. The camera box A has a dark slide W, with adjustable reflector S, and at the other end a draw-tube B containing a microscope object-glass the position of which is adjustable, with a removable box C on the end of the tube. A brass plate *j*, Fig. 2, is held removably in dovetails on the end of the tube, and behind this is a sliding shutter *f* for the central aperture, the pins 1, 2, passing right through the brass plate, thus securing the box *d* thereto and forming guides and supports for the glass plate *p* which may be placed in the box and is further held in place by a hinged door *e* with springs which press upon it when the door is closed. A microscope tube *g* is fitted to the door, either for viewing the glass plate or for condensing thereon the light reflected from a mirror *b* carried

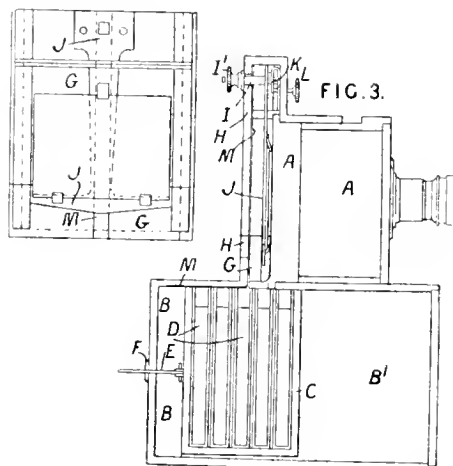
FIG. 2.



by the draw-tube *a*. In taking a photograph of a small object, the latter is mounted on the glass plate *p*, and its image focussed by the main lens upon a screen at the distant end of the camera, after which a photographic plate is substituted and exposure given. Micro-photographs may be taken of negatives placed at the large end, for which purpose a glass plate with scratches upon it is placed in the attachment C and the main lens adjusted until, to an observer looking through the microscope tube *g*, the images of the scratches and of the negative appear to coincide. The box C is then removed, the tube *g* taken out and the aperture filled by a cork, a film being introduced in place of the scratched plate, after which an exposure is given, light being reflected for the purpose from the mirror S. By removing this mirror and the negative, photographs may be taken of real objects placed close to the large end of the camera. A stop with a very small aperture is placed between the lens and the negative.

3298. Clark, W., [Blot, J. B. S.]. Dec. 9.
[Provisional protection only.]

FIG. 4.



Dark boxes; developing; trays and dishes; holders or holders, plate.—Fig. 3 is a section through a dark box with developing baths and a store space for chemicals. The box A is mounted on the developing-chamber B containing in the box C the baths D for chemicals, which can be moved bodily by the rod E with fixing catch F so that any bath may be brought under the plate holder J, shown separately in Fig. 4. A rod I with button I' is attached to the holder and can be moved in a vertical groove H in the hinged door G, and there is also a catch K which secures the holder at its highest point and is released by pulling the button L. Strips of india-rubber M are attached to the plate holder to keep out external light, and the space B' may be used for bottles and other requisites. The baths are formed of glass plates united by liquid gutta-percha.

A.D. 1863.

185. Clark, W., [*Teissonnière, A.*]. Jan. 21.

Positives, producing directly; chromo-gelatine processes; developing; printing.—A positive image is obtained directly from a positive by the use of potassium bichromate or certain ammonium salts, combined with the organic matter of the paper, and by throwing down black precipitates from certain metallic solutions. The sheet of paper, which may be albumenized with sodium or ammonium chloride, is sensitized with potassium bichromate or some ammonium salt, exposed to the action of light, immersed in water and its whole surface treated with the precipitant. The excess of precipitant is then removed by washing, and the paper immersed in a bath of the metallic solution. When the image is sufficiently developed, the paper is washed, dried and coated with some protecting medium. A positive may be obtained in common ink by using solution of tannic acid and iron sulphate respectively. The positive may be produced in various insoluble sulphides, by precipitating them from soluble salts by various soluble sulphides.

256. Clark, W., [*Wittème, F.*]. Jan. 28.
Drawings to Specification.

Statuary, facilitating production of.—Several cameras are arranged round the object to be copied, and photographs are made in them simultaneously by shutters connected to one cord. Each picture may be used to give an outline on a separate strip of wood or other material, which is cut to the outline; these strips are arranged in order at equal angles about an axis to reproduce the original. Or the pictures may be used in pairs, from cameras at right-angles to one another, to guide two pantographs arranged at right-angles, these serving to direct a tool for carving a block. The original photographs may be enlarged by a solar microscope; small objects may thus be reproduced of large dimensions.

Producing caricatures.—These are obtained in the above-described process by distorting some of the original pictures, by mounting them on a sheet of india-rubber, stretched in a frame, and allowing it to contract.

267. Pouncy, J. Jan. 29.

Printing.—The surfaces used for the reception of the pictures may be paper, silk, linen, cotton or mixed fabrics, leather, wood, ivory, glass, porcelain, or stone, or surfaces of metal or metallic alloys, or any other suitable surface.

The sensitive composition employed to coat the surface selected consists of colouring matter, fat, tallow or oil, bichromate of potash, or bitumen of Judea, or both of such last-mentioned substances, and benzene, turpentine, or other hydrocarbon or analogous solvent; the coated surface is dried, and a photographic image is produced on it in the known manner. When this image is produced by printing from a negative, the negative is placed on the uncoated surface of a transparent material prepared as described above, and the light is applied to act through the negative and transparent material on the inner surface of the coating; the parts not acted on by light, remaining soluble, are dissolved off with benzene or other solvent.

Printing, photo-mechanical; ornamenting by photography.—When a lithographic stone is the surface operated upon, it must be grained in a known manner before the application of the ink, and the surface of the coating should be also grained after it has been laid on the surface of the stone. The pictures obtained as described above may be preserved as they are, or transferred to a porcelain surface and burnt in, or transferred to a damp lithographic stone from which prints are taken without warming the stone.

286. Bennett, T. Jan. 31. *Drawings to Specification.*

Backgrounds.—Part of the canvas is to be laid along the floor so that the person or object photographed may stand upon it. This front portion is to be painted in proper perspective so as imperceptibly to "run into" the upright part. For this purpose the upright part is painted first and then the camera is used to obtain the right perspective for the horizontal portion. When the scene is an interior the division between the parts is made sharp by the use of a rod along the fold and secured by buttons on the floor. For outdoor scenery this is unnecessary.

335. Stevens, G. Feb. 6. [*Provisional protection only.*]

Lamps, actinic.—An apparatus for supplying air to the "photogenic" gas light consists of a vessel formed with one or more spiral chambers or compartments, and rotated in an outer chamber, which is filled with water or other fluid, and is provided with inlet and outlet passages for the air &c. The outlet passes into the inner vessel, which is driven by a pulley and a weighted cord or band, or by suitable wheelwork.

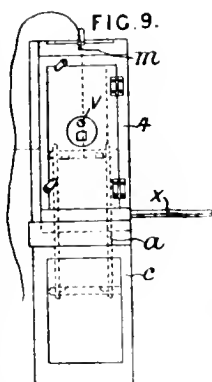
376. Brooman, R. A., [*Lafarge, J. J. L. R. de.*] Feb. 11.

Dark slides; lifters or holders; plate; trays and dishes; sensitized plates; developing.—Collodion plates are sensitized, exposed, and developed without a dark room, by use of a special dark slide 4, plate holders *a* (shown in dotted lines), and baths *c*. The dark slide 4 is made with transverse grooves near one end, which can be slid into guides on the top of either bath *c*, as shown. The dark slide also has a bar *X* to draw out, so as to open the end of the slide 4 to the bath *c*, and thus permit a plate holder *a* to be lowered from the slide to the bath, or to be raised by a piece of catgut, passed through a hole *m* in the slide. The door of the dark slide carries inside two pivoted plates, acted on by springs or by a button *V* projecting from the back. Normally these springs cause the pivoted plates to hold the collodionized glass forward in the slide; if the button is pressed in and secured by a catch, the pivoted plates are caused to be flat in the door, and free the collodionized glass and plate holder *a*. Several forms of plate holder are described. The glass may be held directly in a small screw clip, made of silver, and attached to the catgut. Or the glass may be held between three hooks on a Y-shaped piece. Or it may be held by projections and a button in an open rectangular frame *a*, which is made of copper or brass strips and silvered, or of hard rubber. The openings in the dark slide and the baths are rounded or bevelled to facilitate passage of the plate holder. The bath for the silver solution is of gutta-percha or glass in a wooden frame; the bath for the iron developer is preferably of orange glass, to permit the development to be observed. A cork float carrying a marked rod is used to show the height of the solution in the bath. Each bath has a hinged lid with an india-rubber band, to be held down by two screws for closing the bath tightly.

Plate boxes; chemicals, conveying.—The two baths *c* can be secured by hooks and projections to two sides of a box, which has compartments for bottles and for the plates.

478. Celler, A. Feb. 21. [*Provisional protection only.*]

Cameras; dark slides.—Relates to an arrangement for holding the negative plate in a camera so that the plate can be moved laterally and vertically for changing its position and presenting a new surface to the lens. One or more lenses are employed, a corresponding number of rows of exposures being made simultaneously. The plate



holder is arranged with a series of divisions having suitable holes to form catches at regular intervals according to the size of the impression to be taken. Slides and stops are employed to traverse and fix the holder in a horizontal or vertical direction, so as suitably to adjust the position. The opening of the plate carrier is arranged according to the size of the impressions to be produced. The plate holder is arranged for a number of exposures commensurate with the size of the impressions to be taken, as for instance, for small impressions the plate holder may be arranged for a hundred or more impressions on the same plate without removing it from the plate holder, while for large impressions two dozen may be a convenient limit. Instead of or in addition to the plate holder sliding up and down, the lens or lenses may be mounted on a vertical slide, and the camera may contain two or more dark chambers.

586. Clark, W., [*Poitevin, A. L.*] March 2. [*Provisional protection only.*]

Printing; enamels; sensitized films; developing; producing coloured photographs; photo-mechanical printing.—A paper surface is sensitized by means of a mixture of perchloride of iron and tartaric acid, the impression is produced through a positive, and a developing bath of caseine or albumen with the addition of colour is used; when the photograph is plunged into the coagulating mixture of carbon or other inert colour, the image appears; the sheet is then washed, dried, treated with weak hydrochloric acid, again washed, and, finally, dried. By superposing layers of different colours facsimiles of cameos in the natural colours of objects may be obtained. If a negative be used to produce the impression, a developing bath of gelatine is employed. Relief or copper plate printing surfaces may be prepared from these prints by ordinary methods. A uniform layer of gelatine on paper, glass, or other surface containing the colour is sensitized by means of a solution of perchloride of iron and tartaric acid. When the sensitive surface is dried, the organic matter is insoluble in water, and, in order to take proofs, the coloured coating is impressed by means of "a positive image (reversed)." The image is developed by plunging the sheet "into warm water, when all the parts which have received the action of light will dissolve." The sheet is then dried, washed in acidulated water, rinsed, and, finally, dried. The organic matter may also be fixed "either with alum, perchloride of mercury, tannin, or other body in solution." Metallic oxides or vitrifiable materials may be used as the colouring matter when the print is to be applied and transferred by fusion to an enamel, glass, porcelain or other surface. The soluble portion of the prints may also be applied to stone or metal for inking up with fatty matters for printing &c. The final print may also be inked up on stone, metal or glass. Coarse inert powder may also be caused to adhere to the organic matter to form a relief surface which may be moulded or applied to any suitable surface.

779. Worrall, J. H. March 25.

Photo-mechanical printing; negatives, producing by printing.—Relates to methods of producing surfaces in imitation of woods. Facsimile impressions or representations of wood are obtained by so treating the surface as to render the natural grain available for printing or transferring the pattern to paper or other material, the pattern so obtained being applicable to imitation graining, paper hangings, oil cloths, figuring and embossing leather and textile fabrics, and to other ornamental purposes. The surface of the wood is planed or scraped perfectly smooth and level. If the wood is close grained, the surface is covered with strong or dilute alkalies, or with other specified substances so as to soften and dissolve out the resinous substances naturally present in the pores. If the wood is very close grained, the surface is covered with any corrosive acid so as to corrode the softer parts and leave the harder parts elevated and to enlarge the pores. An impression may now be taken from the surface by any of the well-known plastic, galvanoplastic, topographic, photo-lithographic, or photo-zineographic processes, for obtaining a printing-surface. A stone or zinc printing-surface may be prepared photographically by making a negative by printing an impression from the wood on transparent paper, or by printing on a paper coated with gelatine sensitized with bichromate of potash. The impression is increased in density by dusting it, while wet, with lamp or ivory black, asphalt, &c. The negative or the printed photographic paper after exposure is used in the well-known manner for preparing the printing-surface on stone or zinc.

986. Rafter, H. April 21.

Photo-mechanical printing.—An adhesive photograph is produced either on an elastic film or sheet or on an inelastic porous or permeable plate or sheet. The two sheets are afterwards caused to adhere along the lines of the photograph, and then the elastic film is distended in the parts not adhering by means of air, gas, water, or other fluid, in order to form an electrotype mould. In one process, a drawing or engraving, or a photographic negative or proof is used on either sheet sensitized with bichromated gelatine, and the surface is coated with a mixture of lithographic varnish and resin before washing after exposure. In another process, the inelastic sheet is sensitized with Judea bitumen applied in benzene solution, and, after exposure, the unaltered bitumen is dissolved out, and the sheet is sponged with weak gum water, rolled with a mixture of lithographic varnish and resin, and washed to remove the gum.

1588. Toovey, W. June 23.

Photo-mechanical printing.—To prepare a lithographic stone or zinc plate for printing from, a

positive or transfer is first made by exposing behind a glass or paper negative of the design &c. a paper coated with gum, gelatine, or dextrine &c. and bichromate of potash. The paper thus exposed is placed on the stone or plate, backed with several sheets of damped paper, and strongly pressed. The gum &c. not rendered insoluble by the exposure is dissolved by the water pressed from the damp paper, and becomes attached to the surface of the stone or plate. The transfer or photo is then removed, and leaves a design in gum &c. on the stone, which, after drying, is covered with greasy ink, which attaches itself to the parts of the stone not covered by the gum. After removal of the ink and gum, the design is rolled up with ink. For etching copper or steel &c. plates for printing, a resist is obtained in a similar manner, varnish being used, instead of greasy ink, to coat the plate after the transfer of the photo thereto.

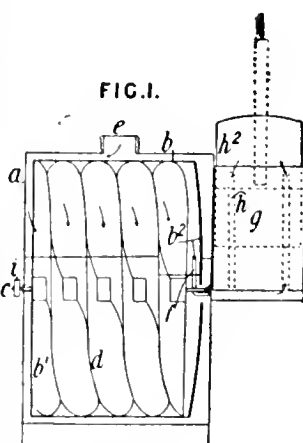
1729. Bourquin, J. P. July 10. [*Provisional protection only.*]

Finishing.—A rolling press for glazing photographic paper and pictures has a steel pressing roll beneath which is a slab of polished glass carried by the travelling-table, the supports for which are two rollers placed at equal distances from and on either side of the vertical plane through the axis of the pressing-roller, whereby a slight yielding of the glass may occur under pressure, and fracture be avoided.

1921. Stevens, G. Aug. 4.

Lamps, actinic.

—An apparatus for supplying a regular stream of air or other gas for the photogenic gas light, ventilation and other purposes, consists of an outer chamber *a* supporting a shaft *c* which carries the inner chamber *b* divided into spiral compartments by the inclined or tortuous vanes *d* also mounted on the shaft *c*. Both chambers are partially filled with water, and, on rotating the shaft *c* by the spur pinion *i* or other means, the gaseous fluid enters at *e*, passes to the



inner chamber at b^1 , and is driven to the end b^2 , where it enters a pipe f communicating with a gas-holder g containing water. The cover h^2 being suitably weighted, a steady flow of gas through the pipe h is maintained.

2028. Lüdeke, J. E. F. Aug. 15. [*Provisional protection only.*] *Drawings to Specification.*

Producing aeronautical photographs.—The camera may be raised or lowered by a rope from an anchored balloon, and may be opened and shut electrically, or by other suitable mechanism.

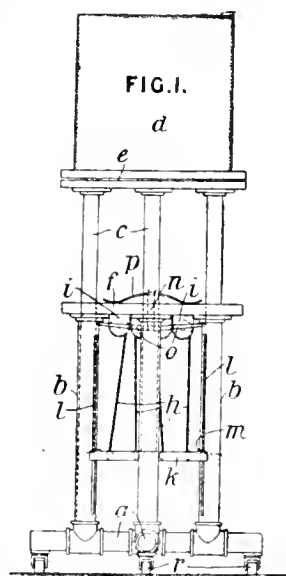
2083. Pegram, T. Aug. 22. [*Provisional protection only.*]

Dark slides.—Two pieces of grooved wood are fitted to the camera back or dark slide, and in the grooves slide two strips of wood, the inner sides of which are notched or otherwise shaped to hold the plates. These strips may be adjusted by hand or by a screw adjustment so as to be drawn together or extended according to the size of the plate.

2252. Whipple, J. A. Sept. 12.

Adjustable pedestals.—A table c for a camera d is carried by one, two, or three telescopic pillars e , the lower parts b of which are mounted on a T-shaped frame a . The lower or fixed tubes b are slotted at e to allow the pins m on the tubes c to project so as to bear on the frame k . One or more cords h , attached to spring

fuses i are connected to the frame k and are arranged to balance or just raise the camera. The lower tubes b are provided with a table f , in which a pin n works and is held supported by a spring p . The lower end of the pin n is connected to pivoted levers o the outer ends of which are forced into contact with the tubes c , through slots in the tubes b , so as to act as detents. The stand is shown mounted on castors or rollers covered with india-rubber or other elastic material.



2954. Davies, G., [*Rister, M.*] Nov. 21. [*Provisional protection only.*]

Sensitized plates.—The squares of glass used to obtain collodion negative proofs are replaced by talc or mica in sheets. A sheet of talc or mica is cut to a size corresponding to the dimension of the negative which it is desired to produce, and fixed on a piece of ordinary glass by smearing the edges with a thick gum. The talc is then cleaned by a tuft of carded cotton-wool, and the collodion is poured on the surface, over which it operates freely. The other operations of sensitizing, developing, washing, and fixing are effected in the usual manner, and by means of the ordinary accessories. When the negative is finished it is only necessary to remove the talc from the glass, and to place it in contact with the prepared paper to obtain the positive proof.

A.D. 1864.

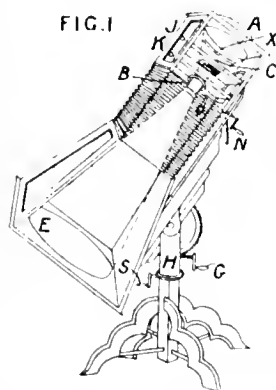
305. **Lee, J., and Thomson, J.,** [*Monat, M.*, partly]. Feb. 5.

Mounting prints and the like.—Depth and softness of tone are obtained by employing or combining two pictures of the same subject to produce one picture, one of the pictures, which is of a semi-transparent character, being placed or mounted immediately over or in front of the second picture. The two pictures may be differently finished and coloured, or two pictures of a different class, such as a photograph and an engraving, may be combined. When two photographs are employed, that which is to be mounted at the back is taken on translucent or other material, and that which is to be mounted at the front is taken, by surface contact or otherwise, on paper or other thin material. The front picture, if on paper, is treated with a transparent resinous varnish, after which it is placed over or in front of the back picture, either in immediate contact therewith, or, preferably, from one-twentieth to one-eighth of an inch therefrom, a separating piece or a sheet of glass being placed between the pictures.

363. **Fontaine-Morcau, P. A., Comte de,** [*Liébert, A., and Lafou-Saint-Cyr, J.*]. Feb. 11.

Cameras; enlarging; camera stands; lenses.

An enlarging camera is mounted on a heliostat so that the condenser may always be directed towards the sun. Doublet or triplet objectives are employed. The heliostat may be operated by handles S and G or by clockwork in the usual way. The negative C to be enlarged is placed between the condenser A and the objective B. The negative C and the condenser B can be focussed by turning the buttons J, K. A concavo-convex lens X is interposed between the negative and the condenser A. A ground glass serving to veil the image in order to examine the impression is actuated by the knob N. The surface E which receives the impression is placed at the end of a conical chamber.



446. **Newton, A. V.,** [*White, G. G., and Alden, C.*]. Feb. 22. [*Provisional protection only.*]

Colouring.—Prints are made on paper which is already coloured or is afterwards coloured yellow by picric acid or other suitable dye to prevent copying. Such a picture may be applied to a bank bill &c.

503. **Swan, J. W.** Feb. 29.

Chromo-gelatine processes; colouring; printing.—The printing paper or tissue is prepared from a gelatine tissue compound which is sensitized at the time of making or afterwards. The gelatine tissue compound is formed of a solution of gelatine containing saccharine matter or glycerine. Gum arabic, albumen, or dextrine may be used in place of or with the gelatine. Colouring-matter in the form of finely ground pigment, such as lampblack, indian ink &c., or a soluble colour, such as an aniline dye, is added to the gelatine. As an example, lampblack or indian ink is mixed with indigo and crimson lake. The colouring-matter may consist of the finely divided pigment and the soluble dye used together. The sensitizing solution consists of a chromium salt, such as ammonium or potassium bichromate, or any other chemical producing an analogous action. The tissue compound is prepared whilst heated, and is filtered through fine muslin or flannel. When the tissue is for use without a backing or support the compound is coated on to glass either plane or cylindrical in form, and after drying is stripped off. The glass may be prepared with oxgall or with collodion to facilitate stripping. A sheet of damped paper may be applied to the dried surface of the tissue before stripping; the whole being stripped off together. Paper may also be coated with the compound by floating it on a trough of the material. Several layers may be applied as required. If sensitized, drying must take place in the dark or in non-actinic light, and is carried out by a current of dry air or by the use of a drying substance such as quicklime or calcium chloride. Printing may be done in a camera or behind a negative in a printing-frame, the collodion surface of the tissue or the tissue surface, when on paper, being placed to receive the light. If the print is to be doubly transferred, it may be developed on a temporary paper support, but, if the print is to be singly transferred, the permanent support may be paper, card, glass, porcelain, enamel, &c. The print may be coated with collodion before being transferred, and if it is intended to colour the final print the collodion may then be removed with ether and alcohol. The temporary support and the print

are preferably coated with an insoluble cement, such as a solution of india-rubber containing gum dammar and gutta-percha, the print and support being pressed together before developing. The permanent support is coated with starch paste or albumen coagulated by heat or with alcohol. After being placed on its support, the print is soaked and any paper backing stripped off, when the paper is developed by washing in warm water; the last traces of bichromate are removed by washing in water for several hours. To transfer from the temporary to the permanent support, the print is coated with gelatine, gum arabic, &c., and the permanent support is pressed tightly down, after which the print is stripped from the temporary support.

829. Potts, F., and Green, A. H. April 2. [Provisional protection only.]

Tripod and like stands.—Relates to a portable stand forming an outdoor sketching or other easel, music rest, target support, or the like, and collapsible into the form of a walking or climbing staff. Three or more standards of segmental tubing fold together into a form of circular or other cross-section, and are united at one end by a joint or cap, and at the other end by solid or other shanks. The rest for the canvas stretcher or board is provided with adjustable attachments. The parts when collapsed are enclosed in a tubular case, the shanks projecting as a spear. The case serves as a mahl or rest stick.

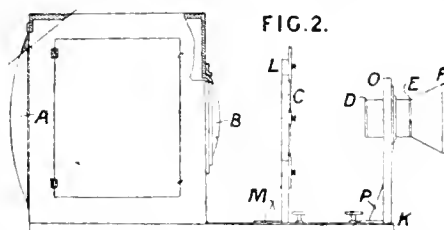
843. Sarony, N. April 5. [Provisional protection only.]

Producing negatives of special character; vignetting.—"Cartes de visite," or other photographs similar in appearance to crayon drawings, ordinarily known as Richmond drawings, and crayon heads are produced by a double process of vignetting direct within the camera; firstly, the bust of a person sitting, or other object required, is vignetted by the use of a graduated glass suspended in the camera. Secondly, an inverted or reverse vignetting glass is arranged to cut out the exposed portion of the plate, whilst that portion of the plate previously unacted upon is now brought into the focus of a drawing which is placed before the lens, and which represents the afore-named Richmond or scroll drawing, the result being a scroll vignette or photograph. The same effect may also be obtained by the process known as "double printing."

1000. Bonneville, H. A., [Monckhoven, D. C. E. van]. April 21.

Enlarging; lenses and lens fittings.—The apparatus is arranged for use with solar light either direct, when mounted as a telescope, or reflected from a mirror moved by a heliostat or by other

means. The condenser is formed of a large non-achromatic crown glass lens A of short focus, the curvatures of the surfaces of which give minimum spherical aberration, and a negative lens B arranged to correct the spherical aberration. These lenses are mounted in a metal or wood box fixed on a base board K which carries two frames



adjustable by racks. The frame L, M is provided with adjusting clips to hold the negative, cut to the required size, in the correct position. The frame O, P, carries the photographic objective D, E and a negative lens F for correcting distortion. The whole apparatus is enclosed in a wooden box to exclude extraneous light.

1060. Brooman, R. A., [Maréchal, C. R. and Du Motay, C. M. T.]. April 27.

Ornamenting by photography; enamels.—The following process is employed to obtain photographically indelible pictures on siliceous substances generally:—A coating of sensitive collodion is laid upon collodionized caoutchouc; the picture being produced and developed upon the sensitive collodion, is fixed "by the consecutive action of soluble iodides or iodo-cyanides, cyanides, or hyposulphites;" salts or subsalts of silver are then reduced from solution upon the picture by means of "sulphate of protoxide of iron." The picture is then "strengthened" by the action of pyrogallie acid or other reducing agent on an acidulated solution of silver. "The strengthening may be continued successively in a number of baths." The "strengthened" picture is then washed in the baths of cyanides, iodo-cyanides, or hyposulphites, or in ammoniacal baths. By plunging the cleansed picture into baths of salts of platinum and gold, the metal of the bath "becomes substituted galvanically for the coating of silver." The substituted picture is again washed in the above-mentioned cleansing solutions, coated with caoutchouc, submitted to heat in a muffle, covered with a siliceous, boracic, or lead flux, and finally "submitted to the action of the fire, which fixes and solidifies it."

1111. Gittens, A. W. May 3. [Provisional protection only.]

Finishing.—Photographic pictures and marbled papers are subjected to pressure between one or more heated rolls or plates. One of the rolls is heated through its entire length, the lamp being

stationary while the roller is free to revolve. The position of the rolls may be regulated by screws working in nuts in boxes carrying the axles.

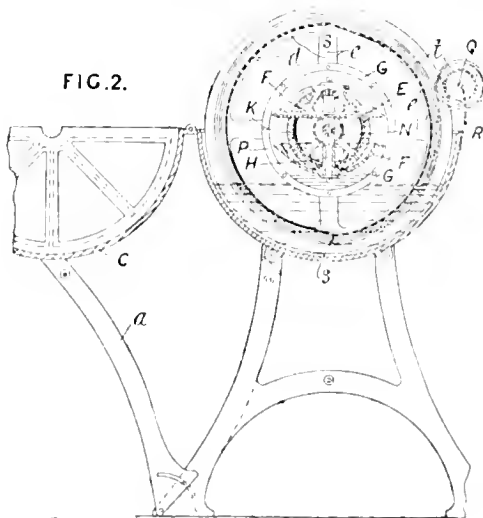
1438. Sarony, N. June 9.

Producing photographs of special character.—To give a photograph the appearance of an engraving or drawing, lines or tints such as artists use on drawings are combined with the photograph, by means of photography, lithography, wood engraving or the like. An etched negative may be used to print the lines over the photograph, or the lines may be on the vignetting mark.

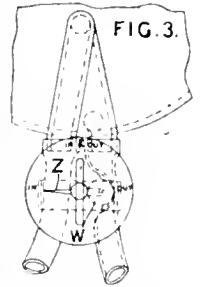
1601. Berthon, E. L. June 25. [*Provisional protection only.*]

Tripod stands.—The feet of a tripod stand for telescopes and other like instruments are made separately, the outer ends being provided with castors, balls, or rollers, and the inner ends consisting of rings which receive the pivot of the pillar of the stand and are retained thereon by a thumb-screw. The telescope &c. is supported on a semicircular or grooved plate and at its eyepiece end is provided with a projection connected to the upper end of the elevating screw, the lower end of which passed into a split screwed socket attached to the lower part of the pillar. The two halves of the socket are closed together to engage the thread on the elevating screw by means of a sliding ring, and the telescope &c. is adjusted by turning the screw by means of a milled button. The lower end of the pillar is provided with a pivot which passes into a recess in a smooth slab of slate or other material.

2079. Grisdale, J. E. Aug. 23.



Washing prints. A centrifugal apparatus is used alternately to saturate and expel the water from the prints. In one arrangement the prints are placed in piles round the circumference of a drum, each pile being composed of alternate prints and wire gauze or open fabric. In another arrangement, shown in section, the prints are placed between layers of fabric *t*, which is wound on from a bobbin *Q*, mounted on spring arms *R*.



The drum is of perforated metal or wire gauze *d*, supported between discs *e*, and may be perfectly round or may have swellings *s* to assist in throwing off the water. The multiplying gear consists of two bevel wheels *F*, whose spindles *H* are keyed to the shaft *E*, and which gear with the pinion *X* of the drum, and two pinions *G* gearing with a dead-wheel *K*. The gear is enclosed in an oil bath *P*. Water is admitted and removed through two flexible tubes controlled by a pinch cock consisting of a ball *W* mounted on a cranked spindle so as to compress either tube or leave them both open. The upper half of the casing *C* is hinged to the lower, and when opened rests upon two supports *a* which fold against the framing when not required. A board may be placed on the open casing to serve as a table.

2122. Thomas, R. W. Aug. 29.

Developing-tents and the like.—A box or case, combined with flexible material, is arranged to open into a tent, in which the apparatus and materials employed are fixed in position suitable for use as soon as the tent is opened out, and retain their positions when the box or case is contracted for transport, thus dispensing with the packing and unpacking of the apparatus and materials. The tent, when in use, is fixed at the top of a tripod stand, and is constructed of a box, having the two ends and back fixed to the bottom, whilst the front is hinged at its bottom edge in such manner that it may fold down. The inclined bath is secured in the position in which it is used, both during transport, and when the tent is in use. The top or cover of the box is in two parts, respectively hinged to the two ends of the box; when closed the cover comes just above the top of the inclined bath. The flexible material is fixed to the edges of the cover in such manner that, when its two parts are open, the flexible material forms a covering to the tent as well as a part of the back of the tent; two sliding bolts hold the upper part of the front above the head of the manipulator. The gutta-percha sink is placed in the centre of the bottom of the box or case, and the camera is arranged to be strapped or fixed to the bottom of the tent when placed on the cover of this sink.

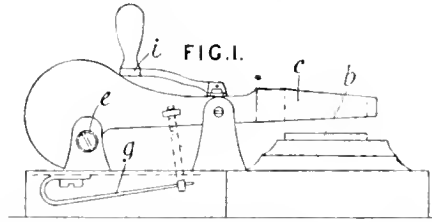
2143. Rollason, A. Aug. 31. [*Provisional protection only.*]

Finishing.—Collodion or a composition containing it is applied to photographs &c. in order to give them a glazed or varnished appearance. Collodion or a mixture of collodion with a gum, such as animi, resin, and balsam of aniseed, or oils, such as linseed, nut and castor oils, is poured upon a polished glass or metal surface and allowed to dry. A cement of gum arabic, dextrin, albumen, gelatine, sugar, honey, isinglass, or the like, either separately or combined, is brushed or poured over the collodion and allowed to dry. The material under treatment is then moistened, placed on the prepared surface and allowed to dry. After cutting around its edges, the object together with the coating of collodion is removed from the glass surface.

2190. Placet, P. E. Sept. 8.

Photo-mechanical printing; producing negatives of special character.—Relates to a photographic process for producing on a metal, glass, porcelain, or other surface a relief design in resist for etching or engraving, or deposition of metal, and applicable for producing a lithographic printing-surface, or a relief or intaglio surface for printing or ornamenting. The surface is coated with a mixture composed of albumen, potassium or ammonium bichromate, and a small quantity of glycerine or sugar; a few drops of ammonia may be added to clear the mixture. The surface is dried, exposed under a design plate or cliché, and washed in water. Albumen may be replaced by bitumen, resin, gum, gelatine, dextrin, gluten, casein, or other animal or vegetable matter sensitized with salts of gold, silver, uranium, chromium, or iron, or with sulphides, iodides, or the like. The unprotected parts may be treated in various ways. In some cases, a ground of powdered resin is first applied to the surface. The parts may be gilded, for the action of the galvanic process, or of acids or other agents; or they may be brought up in relief by means of amalgams of copper, or of metals with low melting-points; or they may be covered with platinum, iron, or oxidized copper. The design itself is removed by any agent, and is brought up in relief by means of copper amalgams or otherwise. The surface may be inked after amalgamation, or the unprotected parts may be iodized and inked, or inking may be done without iodizing, for lithographic printing. The unprotected parts may be coated with metal by electrodeposition, for producing a relief or intaglio surface for printing or ornamenting; by prolonging the deposition, the design is covered, and an intaglio surface is obtained on separation. The surface obtained as described above may be used in many ways, for example, the metal partially deposited may be brought up in relief by means of collodion, varnish, gelatine, or other material, whereby a photographic plate is obtained, in which the black parts are formed by the deposited metal.

2197. Frowirth, D. Sept. 8.



Cutting prints and the like.—The block *b* is made of the form and dimensions of the required print, and the internal edges of the cutter *c*, pivoted at *e*, fit the outer edges of this block. On turning the handle *i*, the cutter *c* is raised by a cam against the action of the spring *g*. The print is then placed on the block *b* and on further turning the handle *i*, the cam allows the cutter *c* to fall rapidly, under the influence of spring *g*, and cut the print.

2300. Schott, J. B. Sept. 20. [*Provisional protection only.*]

Envelopes for packing plates and the like.—An envelope for photographers and others is constructed so that upon opening the envelope, the photograph enclosed will appear encased in a frame, such as is known as a passepartout, but without a glass covering. Near one end of an oblong piece of material, an opening of the shape of the photograph is cut, and this part is folded over on to the rest of the paper and gummed at the top and bottom, thus leaving an opening for the photographs at one side only. When the photographs have been inserted, the part containing them is again folded over, the end cut and gummed like an ordinary envelope, the overlap brought over, and the envelope closed.

2338. Woodbury, W. B. Sept. 23. *Disclaimer.*

Chromo-gelatine processes; transparencies; copying; photo-mechanical printing.—From a chromo-gelatine mould produced by photography, a metallic mould is formed, from which a casting in porcelain, or coloured gelatine is taken, this latter forming a transparency. The sensitive film for the first mould consists of a mixture of sugar, gelatine, and bichromate of ammonia, which is poured on a sheet of glass or mica and stripped off when dry. The film is then placed on a negative and placed in the focus of a solar camera or condenser. When printed sufficiently the picture is developed by washing. An electrotpe copy in copper of the gelatine, is then made, and into this plastic semitransparent porcelain, coloured gelatine or the like is pressed. This casting when finished forms the transparency. To copy a bas-relief or intaglio, it is placed in coloured water and then photographed.

2347. Wortley, A. H. P. S., and Vernon, W. W., [*Wothli, J.*] Sept. 21.

Printing-paper.—The surface of the paper is covered with starch, albumen, or the like which is incorporated with the paper by pressure between two polished surfaces, or by rolling or the like. A mixture containing collodion, nitrate of uranium, and nitrate of silver is employed to sensitize the paper. The picture is printed in the exact intensity required and not overprinted. To produce a "matt" surface, the sensitive salts are dissolved in alcohol and water instead of in collodion. Saccharine substances may be added to the solutions if necessary. The paper thus prepared is hung up in a dark room to dry.

2465. Fontaine-Moreau, P. A., Comte de, [*Truchelut, J. N.*] Oct. 6.

Colouring; copying drawings; enlarging; finishing; printing.—Photographs are obtained direct on cloth, canvas and other materials. The cloth &c. is surfaced with virgin wax, spermaceti or cocoa butter, together with resin and elemi, dissolved in essence of lavender, and mixed with carbonate of lead. When dry, it is heated, and its surface is spread over with a thin layer of white wax, to which has been added the above-mentioned resinous substances. The collodion is spread on the resulting waterproof surface, and a photograph is obtained by ordinary copying processes on the surface. The photograph may be obtained by collodion, albumen, gelatine or charcoal processes. Silver prints may be toned with gold chloride. The photograph may be an enlargement, and may be retained as a plain photograph or may be painted. To render the photograph indestructible, it is allowed to dry for some days; then a flat iron, with a long handle, is moderately heated and passed behind its surface, forming an entire homogeneous substance with the layers of paint, oil, and collodion.

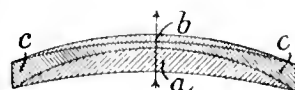
2526. Brooman, R. A., [*Baudesson, A., and Houzeau, P.*] Oct. 13.

Sensitized plates and films; ornamenting by photography.—Consists in obtaining upon paper, textile fabrics, wood, glass, porcelain, &c., a deposit which is coloured or can be coloured by chemicals, dyeing, &c. Paper is sensitized by baths of (1) ammonium ferrocyanide, or ferricyanide, or a mixture of the two, (2) potassium or other prussiate, (3) a prussiate "with a base of iron at the maximum, "and of organic acid salts of iron," and, (4) a "double salt of iron and of ammonia, an oxalate, "a tartrate, a citrate, or otherwise." When using No. 3, the image appears in blue after exposure, the whites are removed by washing, and the tone sharpened by an acid, tin bichloride, or other chemical. When using No. 4, the image is developed, after washing in a weak acid bath, with potassium ferrocyanide to obtain blue tints. Tannin yields black tints, and ammonium or

potassium sulphocyanide blood-colour tints. A quick bath is formed of equal parts of ammonium ferricyanide and iron citrate. For fabrics, ammonium ferrocyanide and ferricyanide, or potassium ferricyanide and iron citrate, or ammonium ferricyanide and iron citrate, give a blue colour, the image being brought up by tartaric acid. The well-bleached undressed fabric is impregnated in a bath of "yellow salt" (potassium or ammonium ferrocyanide), and is then stretched and left to dry in a hot place. It is next exposed under a negative until the blue colours developed assume a metallic aspect, after which it is carefully washed, wrung out, soaked for an hour in a dilute sulphuric-acid bath, washed, soaked in a dilute hydrochloric-acid bath, containing tin bichloride, and finally again washed. To obtain a black colour, after passing through the sulphuric acid bath, the fabric is boiled in a solution of "gelatine glue" and logwood, washed, boiled in a soap solution until the whites appear, and again washed. "By modifying the manipulation, and "the nature of the dyeing baths," different shades of brown, violet, red, yellow, bronze, and olive are obtained. For example, for violet, the blue colour is decolorized in a bath of sodium carbonate, dyed with madder, and brought up by chloride of lime and a soap bath. For bronze, the image is decolorized as before, dyed with madder and quercitron, and brought up in a soap bath. For olive and brown, the image is decolorized, dyed with quercitron, and brought up in a soap bath. The ordinary mordants may be used, such as iron mordants obtained from a mixture of iron perchloride and tartaric acid, double ammonium iron oxalate and alumina. The latter allow of obtaining red, rose, and yellow tints.

2539. Dallmeyer, J. H. Oct. 14.

Lenses.—A negative flint-glass meniscus lens *c* is placed, it may be cemented, between positive crown-glass meniscus lenses *a*, *b*. The



focal lengths of the crown glass lenses *a*, *b* are in the ratio of 3 : 1 respectively. Reference is made to Specification No. 2574, A.D. 1857.

2717. Fox, T. Nov. 3. [*Provisional protection only.*]

Printing; photo-mechanical printing.—Paper is floated on a solution of bichromate of potash and sulphate of copper. The paper having been dried, is exposed under a negative and is afterwards floated on a decoction of logwood. After sufficient exposure the print is removed and dipped in hot water, which removes the superfluous logwood. The print is completed by drying and varnishing. The print may be transferred to paper or cloth by passing it through a press

with the printed side in contact therewith. It may be transferred in a similar way to wood, stone or the like.

2800. Willis, W. Nov. 11.

Producing photographs of special character; copying documents, drawings, and the like; positives, producing directly; photo-mechanical printing.—Drawings, engravings, lithographs, photographs, and written or printed documents &c. on transparent or semi-transparent material may have a positive copy produced therefrom on paper, collodion, fabric, or on wood blocks for wood engraving by the following process:—The surface to receive the copy is first coated with a solution of bichromate of ammonia, or other soluble chromate, mixed with sulphuric, phosphoric, or other suitable acid, in proper proportions, and when dry the surface is exposed behind the original drawing &c. in the usual manner, until the part which is acted on by the light is bleached. The image is then exposed to the action of a solution or vapour of aniline, or other substances, such as toluidine, pyrrol, and salts of these bases; one method of doing this, in the case of sensitized paper, being to lay it in a box, on the underside of the lid of which is placed blotting paper, supplied with drops of a solution of aniline in benzol; the aniline vapour combining with the unchanged bichromate, forms dark parts, insoluble and unchangeable by light. The picture is then washed in water, and sometimes also in very dilute sulphuric or other acid. The sensitizing liquid may also be made of chromate of copper, sulphuric, and phosphoric acids, or phosphate of copper, sulphuric, and chromic acids. When substituting for aniline a mixture of pyrrol bases, with other organic substances obtained by distilling mucate or binucate of ammonia, the mixture, being strongly alkaline, must be neutralized with sulphuric acid.

2953. Crozat, L. Nov. 25. [*Provisional protection only.*]

Producing coloured photographs; printing; finishing; vignetting.—To produce portraits in "double ground," the sitter is placed before a white cloth, the ground of which is coloured and graduated or shaded. The negative is taken in the ordinary way. To produce a shaded bust terminated in white, a piece of paper is applied to the non-collodionized side of the plate, and the size of the bust traced thereon; this outline is marked on a piece of opaque cardboard, and the said cardboard placed in the pressure frame. The "shading ground" has thus been obtained. To obtain the general ground, a proof of the bust is stuck on the painted side of the glass. Then continue applying the white ground portraits on the glass so that the head perfectly covers the silhouette which also covers the shirt front, and by thus supporting the portrait with a tablet of the same size as the card, expose it to the sun. The double ground, when obtained, must be toned and

fixed as usual. The eyes and shirt front are then to be covered with gum arabic solution to preserve them from the colouring which is to be applied to the whole face. The portraits are coloured with a brush by applying a solution containing alum, cream of tartar, cochineal, saffron, and magenta. When coloured, great brilliancy is given to the portrait by stretching it on prepared glass and allowing it to dry; it is then detached from the glass and stuck on cardboard with a solution of gum arabic. The glass is prepared with a varnish containing "photographic cotton" and is afterwards coated with a warm solution of gelatine.

3048. Martius, C. A., [*Obernietter, J. B.*]. Dec. 6.

Ornamenting by photography; enamels; sensitized plates.—Relates to the production of photographic transfers for luting on porcelain, glass, and other ceramic ware. An image is printed from a positive plate on a glass or other smooth surface sensitized by coating it with a mixture of gum 5 parts, sugar 15, glycerine 5, ammonium bichromate 6, and water 100 parts, and drying. The print is then coated with a powder consisting of 100 parts of porcelain colour and flux, and 1 part of dry powdered soap, the colour adhering to the parts unacted upon by light. The picture is next coated with collodion, then dried and immersed in water made slightly alkaline; it may then be separated from the plate, and, after being washed, is pasted with the printed face on the article, and the collodion removed by ether or the like. The picture is then fixed, and may be painted with ceramic colours.

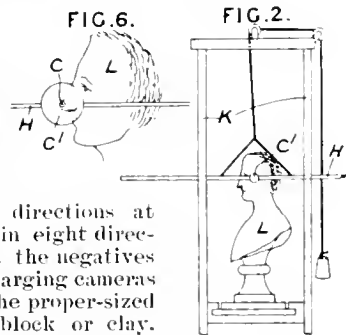
3107. Claudet, A. F. J. Dec. 11.

Statuary, facilitating production of.

The object of which it is desired to make a statue or a clay model is photographed

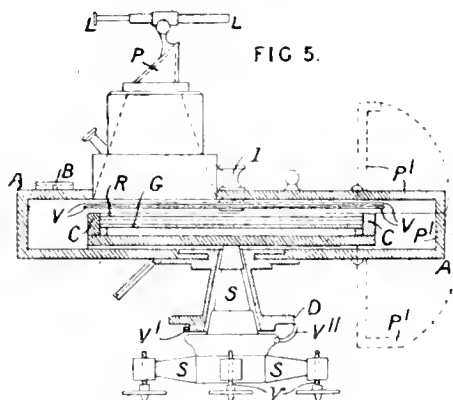
in two or four directions at right-angles, or in eight directions at 45°, and the negatives are placed in enlarging cameras so as to throw the proper-sized images on the block or clay.

In front of the block L is a frame K with pulleys and a cord supporting the movable bar H on which is fixed a white disc C¹, at the centre of which is a black spot C, Fig. 6, a carving tool projecting from this point towards the block. The frame is placed so that the disc may be in the focussing-plane, and the bar is then moved so that the black spot may pass round the outline of the image thrown by the camera, the tool marking the block as it does so. Alternatively, the bar and frame may be dispensed

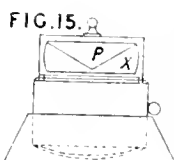


with, sharp blades being thrust into the block to mark the outline of the image thereon and the work checked by placing a ground glass plate in the focussing-plane from time to time and comparing the outlines. By thus tracing outlines from different aspects on the block, correct shaping of the statue is facilitated.

3119. Chevallier, F. A. Dec. 16.

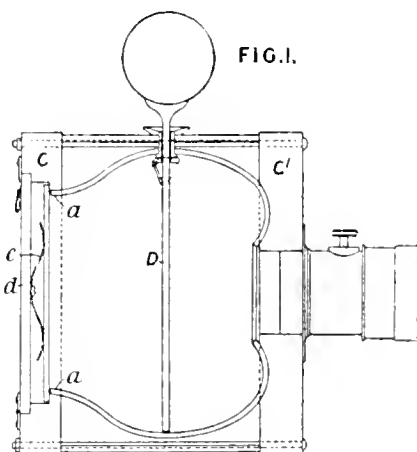


Cameras; dark slides; shutters; measuring by photography. — Relates to photographic apparatus for obtaining panoramic views, and is particularly adapted for use in surveying as a plane table for finding horizontal and vertical distances and angles. In the arrangement shown in Fig. 5, the optical apparatus, consisting of a reflecting prism P above the object glass of a camera, is carried by a dark chamber A mounted to turn on a conical pivot S supporting a frame C with a sensitive plate or surface G and shutter R. Radial shutters V on a pivot I admit a beam of light from the camera to the plate G, and the chamber A is rotated continuously or intermittently by a tangent-screw V, a spring or weight motor, or by hand, to obtain a complete panoramic picture. The apparatus is fitted with a telescope L, a compass B, a level, levelling-screws v, a graduated disc D and vernier V¹¹, and movable flaps P¹ to admit the frame C. Two hairs or threads arranged at right-angles to one another in the slit between the shutters, indicate the horizon and the direction of vertical lines. The shutters may be operated by a rack and pinion, or sliding rods, and pins sliding in slots, and may be mounted between central semicircular guide-



plates. The width of the slit is indicated by the operating-rods and external scales or verniers. A segmental view of a portion of the horizon, or a circular view of the whole horizon, is thus obtained, with the tops of the trees &c. at the circumference or towards the centre of the picture. The dark box A may be fixed, and the optical apparatus mounted to rotate on it. Fig. 15 shows a conical reflector P and lens X for taking in the whole horizon and photographing it in one operation. The optical apparatus may be arranged below the dark box, and the sensitized plate may be protected by yellow glass to allow the operator to follow the image and control the operation. The apparatus may be mounted to rotate on a horizontal axis, and the prism may be replaced by a plane reflector.

3175. Johnson, J. H., [Bourdin, G. J.], Dec. 21.



Cameras; developing; sensitized plates. The plates are sensitized and developed without removal from the camera. An orange-coloured glass vessel is supported by two upright pieces C, C', one of which carries the lens, which is opposite an aperture in the vessel. The back of the vessel is open, and the upright C has a door d which when shut keeps the plate pressed against the lip a of the vessel by means of a spring c. A hole at the top of the vessel fitted with a spring valve serves to introduce the sensitizing or developing liquid from a ball and tube D. By turning the camera about, the liquid can be spread over the plate, and the excess is sucked out again by means of the ball and tube. The lens and the door may be fixed to the vessel itself without any separate frame.

A.D. 1865.

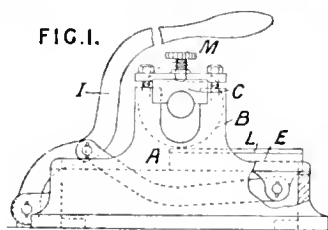
10. **Gye, F.**, [Strelisky, L.]. Jan. 2. [Provisional protection only.]

Mounting prints.—Two copies of a picture or print, coloured or uncoloured, are made on thin and thick paper and are mounted superimposed on a sheet of glass. The thin picture is rendered transparent and is secured, preferably to the roughened surface of ground glass, by spermaceti, varnish or sufficiently transparent cement. The thick picture is placed in exact position behind the thin picture and is secured by an adhesive or otherwise. The combined picture may be placed in a frame.

12. **Helsby, W. G.** Jan. 3. [Provisional protection only.]

Producing coloured photographs on polished coloured opal glass. The opal or other coloured enamel and the glass are united together in the process of manufacture in the usual way, but instead of the glass to or with which the enamel is secured or made being transparent and colourless it is made with a "body colour" of any desired tint or "quality by placing the proper materials in the "glass pot;" rose and cream will be the most desirable colours when the enamel is opal, but the colours may be varied. When the enamelled surfaces are polished the sheets are ready for use.

56. **Bentley, B. W.**, and **Bailey, W. H.** Jan. 7.



Embossing photographs; finishing.—A mounted photograph is rolled in a press, and is then placed upon a suitable matrix beneath the die of an embossing press. By this means the most prominent parts of the picture are raised, and a picture in "relievo" obtained. The dies may be produced either in the ordinary manner, or they may be made by any of the well known photographic processes of engraving or by the "bichromatized gelatine process." Medallion portraits in relief may be obtained, or imitation "cameos" may be made by colouring the background. A rolling press has a cast-iron framework to receive bearings C for the roller B. The sliding plate E, which travels upon the top of the framework and

beneath the roller, is actuated by a link A which is attached to a centre or pin that passes through lugs attached to the underside of the sliding plate; the other end of the link is connected to the working lever I which is jointed to a pin that passes through lugs fixed to the framework. A sheet of aluminium bronze L is affixed to the upper surface of the sliding plate E. The roller is pressed upon the sliding plate by means of mill-headed screws M. The actuating lever enables the sliding plate, with the photograph upon it, to travel beneath the pressing roller. In the larger sizes of presses a reciprocating motion is imparted to the plate by means of a crank or an eccentric on a shaft carrying a flywheel and winch handle.

Transparencies.—The Provisional Specification refers to paper &c. transparencies formed by means of an embossing-press, the die of which produces an intaglio impression on the paper. The paper &c. transparency may be mounted between sheets of glass and placed in a window or lamp shade.

72. **Pettitt, E.** Jan. 10. [Provisional protection only.]

Producing photographs of special character.—The collodion side of transparent positive photographs, or the side of the glass on which the picture is situated, is coated with plaster of Paris, cement, wax, or other opaque or semi-opaque substance, either white or tinted with colour, and is afterwards covered with a coating of metal, which coating of metal may either be applied by the electrotype process or be applied in the form of thin sheets of foil attached by any adhesive matter. The photographs may also be coated or covered, either wholly or in part, with coloured materials, such as velvet, silk, or other fabric, gold and silver leaf, and coloured bronzes, the photograph being afterwards coated in the manner above described.

618. **Pettitt, E.** March 4.

Cameras; composite photographs, producing.—Two stereoscopic negatives of an object are obtained through which light is passed and focussed by lenses to coincide on a sensitive plate and produce what will be a positive by transmitted light which is said to possess great relief. The stereoscopic negatives are obtained by a camera obscura having two lenses and fitted on the top of the camera with a front sight having cross-wires and a back sight with a small hole or perforation, the same instrument being available for combining the two negatives, preferably after they have been transposed. By adjusting the distances of the lenses from the plates, the size of

in a perforated disc carried by a clock motion. The perforated disc is frictionally mounted on its arbor, and carries an indicator disc for varying the exposure. The shutter is closed and the clock stopped when the pin is in engagement with the perforated disc. To start the exposure, the shutter is raised by hand at the same time that the clock is started.

1171. Rowland, J. A. April 26. [*Provisional protection only.*]

Cameras; lens fittings.—Relates to cameras for taking large or panoramic pictures with lenses of moderate size. The lens is mounted in a brass chamber or slide, to the end of which is adapted a diaphragm chamber the aperture of which is of a long narrow form placed vertically. The lens chamber is held in a vertical position by means of two fixed studs which work in grooves made longitudinally along the top and bottom of the camera. The lens is also maintained in its proper vertical position by a similar arrangement. By traversing this long narrow opening of the diaphragm chamber along the grooves provided for the purpose, the changing image from the long narrow opening falls on to the sensitive surface. The traversing motion of the lens and diaphragm is effected by toothed gearing or by a screw working in a nut connected with the diaphragm chamber, and this mechanism may be worked by means of a winch with a uniform slow motion adapted to it, or the diaphragm may be moved by means of a cord or chain actuated by clock-work capable of being driven at a regulated speed according to the state of the atmosphere.

1174. Smith, W. H. April 26.

Printing; toning; producing photographs on wood, canvas, silk, glass, &c.—The wood, &c., surface is first prepared by filling the grain, &c., with a "base" composition. The "base" composition consists of either, a mixture of "valata," gutta-percha, or india-rubber dissolved in benzole or other hydrocarbon; pelt, gelatine or other gelatinous substance dissolved in water; or gelatine dissolved in water mixed with washed whiting and linseed or other oil. The surface prepared with the last mixture is smoothed and dried with pumice stone and water. The "receptive" or sensitizing material consists of a solution of gelatine and honey in water which is divided into two portions; to one portion is added a chloride or bromide, such as cadmium chloride, iodine, tartaric, citric, or other acid, and to the other portion is added nitrate of silver. Portions of these are mixed together. A second solution consists of collodion prepared from flax to which is added a chloride or bromide, such as cadmium chloride, iodine, tartaric, citric, or other acid. The coated article is then dipped in a silver nitrate bath, and after drying is immersed in a solution of gelatine and honey. Iron may be used in some cases with the silver instead of the chloride salts. After the prepared surface is

dried, it is printed upon by ordinary methods and the print is toned with ammonium sulphocyanide and gold chloride or any ordinary gold toning solution.

1184. Grainger, A., and Girdler, C. M. April 27.

Enamels; colouring.—Relates to the production of photographic likenesses on porcelain or ceramic ware, and consists in producing the photograph or likeness of a person or thing on the ware itself. A plate of porcelain or other ceramic material is glazed with a transparent glaze and burnt on as usual: the likeness is produced on this by means of photography. The photograph may now be coloured by hand or by other means, then glazed or enamelled again, and burnt to complete the article bearing such portrait or likeness. Instead of colouring the photograph before glazing a second time, it may be left uncoloured, and glazed and burnt in as before mentioned. Borax or other suitable flux may be used for the glazing. The photographic representation may be produced upon metal or other material, which in other respects is treated and prepared as hereinbefore described, the glazing and baking rendering the representation enduring and applicable as hereinbefore described with reference to plates or pieces entirely of ceramic material.

1313. Parkes, A. May 11.

Sensitized plates.—Collodion for photographic plates is produced by dissolving pyroxylin in glacial acetic acid, aniline, or nitro-benzene, the latter distilled over hydrochloric acid or calcium chloride, and combining the solution with collodion made with other solvents.

1522. Bolton, F. J., and Matheson, H. June 2.

Photo-mechanical printing.—Printing-surfaces for lithographic and like printing are formed by coating a lithographic stone, zinc, or other plate or surface, with a composition consisting of gum arabic, gelatine, or starch, and bichromate of potash, the operation being performed in a dark room. The coating is then dried, and the picture, engraving &c. or photographic negative of which a printing surface is to be made is placed on the prepared surface face downward. The surface with the picture placed on it is then exposed to the action of light, and the stone or plate afterwards immersed in water face downward to dissolve the unaffected gum, gelatine &c. A solution of soap in turpentine, or other solvent free from water, is then spread over the face of the block and the solvent allowed to evaporate, thus filling with fatty acids the recesses in the face where the composition was unaffected by the light. The block is finally soaked in a solution of a bichromate salt, and may then be used for lithographic, zincographic or other printing in

the usual way. The surface may be prepared on a sheet of paper, metal foil, or other flexible substance and transferred to or fixed on a suitable block. The process is applicable to chromolithographic printing.

1541. Newton, W. E., [*Leggo, W. A., and Desbarats, G. E.*]. June 5.

Photo-mechanical printing.—Relates to a photographic process for obtaining stereotype or electrotype printing surfaces from prints, drawings, manuscripts &c. on transparent media. In the case of a photograph on glass the plate is first varnished and coated with an emulsion of gelatine and potassium bichromate. The plate is then exposed to light face downward, and the unaffected gelatine dissolved by warm water. The original picture is thus reproduced in relief in the gelatine. A plaster cast may be taken from this mould, from which stereotype printing surfaces may be obtained in the ordinary way. To produce an electrotype the gelatine mould is moistened with warm water and successively immersed in melting wax until a sufficiently thick coating is obtained. The wax cast is removed from the gelatine face by placing it face downward on a metal plate coated with heated wax, and after being coated with graphite an electrotype may be obtained in the usual manner.

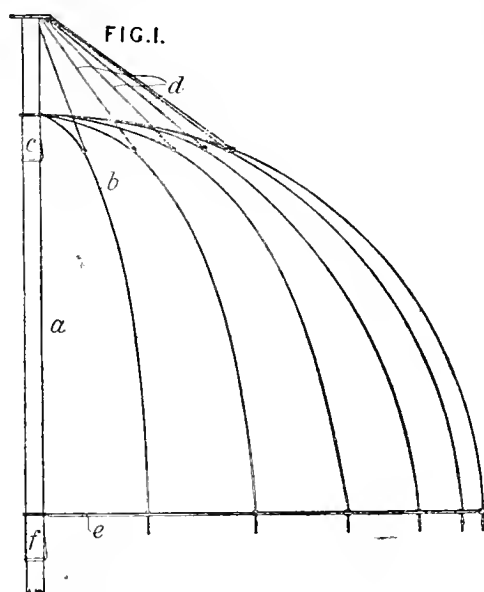
1791. Swan, J. W. July 6.

Photo-mechanical printing.—Relates to means for producing intaglio or relief printing-surfaces and lithographic or zincographic printing-surfaces, and to a method of printing from intaglio plates. In order to produce intaglio printing-surfaces, an image is formed on a gelatinous tissue, treated with a bichromate and with colouring-matter, as described in Specification No. 503, A.D. 1864, by superposing a negative of the subject to be engraved. By means of the colouring-matter the depth of the lights can be governed. The tissue, after exposure and before development, is mounted on a slate, glass, or other surface. The image may be produced by means of a camera, in which case the tissue is formed on glass plate previously coated with caoutchouc or coagulated albumen. The plate is developed in warm water, and is surrounded with a metal rim. The gelatine is acted on by a solution of a protosalt of iron, or sulphate of aluminium, to harden the surface, and a coating of silver or other conductor is deposited on it. The plate is then electrotyped with copper which is strengthened by a backing of soft metal. The plate is printed by greasing its surface and pouring on it slightly warm ink composed of water, china ink or other colour, and gelatine. A piece of paper is placed over the ink and pressed down until the ink solidifies, when the print is removed. The paper is coated with gelatine, collodion, albumen, &c., to prevent coloration in the high lights of the print. The impression is given by a thin steel or other plate

which may be fitted to the underside of a rigid flat plate forming the fixed head of a press. The electrotype plate may be raised by a screw and hand-wheel. The thin plate is curved so as to give a gradual pressure, which may commence at the middle of the paper. The curvature may be given by a weighted lever acting on a plunger at the back of the plate, or by springs placed between it and the fixed head, or the plate may have a curved set, its ends being left free to allow flattening. The rigid plate may be hinged to the back of the press, pressure being applied by hand or power. The prints are fixed, to prevent injury by water, by treating them with a solution of alum or the like, or by adding a fixing substance to the ink. To produce engraved plates capable of giving the lights and shades of a photographic negative, an increased quantity of colouring matter is used to diminish the penetration of the light, and the metal rim is dispensed with. To prevent the removal of ink from the recesses in wiping, thin walls or points are formed in the recesses to give them a trencled or cellular structure. This is effected by forming opaque lines or dots on the negative of the object to be engraved, or in the film of collodion or albumen on which the gelatinous tissue is formed. Opaque lines are produced by taking a photographic negative of a plate of glass coated with an opaque ground on which lines are drawn by a ruling-machine or otherwise. Dots are similarly produced by means of a dark screen perforated with small holes or by dusting opaque matter on the negative or by applying a solution of gelatine or the like through which opaque matter is diffused. A copper plate is then produced by electrotyping as before and is printed with ink of such transparency, or weak colouring power, as to yield prints possessing gradation of light and shade proportional to the depth of the recesses. For typographic or lithographic printing, an image resembling a crayon drawing is produced by means of dots of opaque matter. A solution of gelatine containing bichromate of potash or ammonium or other chromate, and powdered charcoal or the like is spread on a surface of paper, glass, &c. When glass is used, it is first treated with ox gall or other substance to facilitate the stripping of the sheet. The gelatine tissue may be prepared on paper and afterwards impregnated with bichromate. The sensitized sheet is exposed in contact with a negative, and the exposed surface is then coated with a solution of caoutchouc and dammar in benzol. A plate of glass is coated with the same solution, and the two coated surfaces are pressed together. The soluble parts of the gelatine are then dissolved out with warm water. If the image is produced by means of a camera, the gelatine film is formed on glass, which is inverted while the gelatine is fluid. The opaque particles will then be smallest and fewest next to the glass and will increase in size and number towards the outer surface. The plate is exposed with the uncoated surface of the glass towards the light. The photograph may be obtained by diffusing powdered iodide, chloride, or bromide of silver through collodion, albumen, gelatine or the like. Another method consists in dusting charcoal or the like upon an exposed surface of which the

hygroscopic properties have been modified by light transmitted through a negative or positive photograph. A photograph obtained by the above processes is used to obtain by any known process a typographic, lithographic, or zincographic printing surface.

1808. Willis, J. July 7.



Developing tents.—The framework consists essentially of steel ribs with stretchers and adapted to an upright pole in a similar way to that of an umbrella so as to be collapsible, and is covered with suitable material. The upright pole *a* is formed with three legs at the bottom so as to fix into the ground. The elastic steel ribs *b* are attached to the sliding runner *c* and to stretchers *e* which are attached to a runner *f*. The upper parts of the ribs *b* are suspended by wires or rods *d*, *d* which are fixed to the top of the pole *a*.

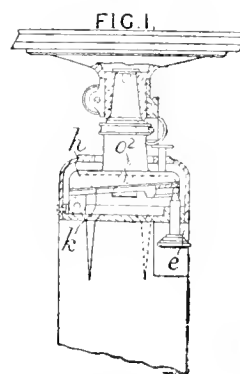
1984. Wells, F. R. Aug. 1. [Provisional protection only.]

Sensitized plates.—A copper plate is sensitized with iodine vapour or bromine fumes or with a solution of bromine or iodine. A picture or engraving is thus produced on the surface of the plate and serves as a good guide for etching or engraving thereon.

2065. Budenberg, A., [Jähns, C. J. R.]. Aug. 9.

Tripod and like stands.—For adjusting levels and other instruments, a plane or collar works on a horizontal hinge or wedge, or otherwise, and may be adjusted by means of a vertical screw opposite

the hinge or wedge. On this plane or collar works another plate, disc, block, or collar, with one face parallel to that of the lower plane and another inclined to it. The upper block is turned till the horizontal lines on its upper face, indicated by a spirit level, are parallel to the hinge. The vertical screw is then turned till the whole upper face is horizontal. Fig. 1 shows one form of apparatus, in which the screw *e* has a ball head, and the upper block *h* and lower plate *k* are connected by means of a pin *o* with a hemi-spherical head. In another form, the socket of a theodolite or other levelling or surveying instrument is screwed to a hollow cylinder with an upper oblique face turning in a plate adjustable about a hinge.



2110. Henry, M., [Aet, H.]. Aug. 15. [Provisional protection only.]

Photo-mechanical printing; negatives for photo-mechanical printing and producing.—To produce an artificial grain on the negative, a drawing is made in fine white lines on an antiphotogenic background, or *vice versa*, and a negative is made by first photographing the grain and then the object, or *vice versa*. On the coated side of the negative is placed a film of gum or gelatine sensitized with bichromate, and the negative exposed. The parts of the film unacted upon are then dissolved out, and the drawing metallized by silver nitrate or other agent and then electrotyped, or an impression taken in a plastic material, and this electrotyped.

2754. Newton, W. E., [Montgolfier, L. de]. Oct. 25. [Provisional protection only.]

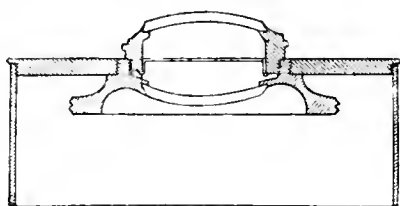
Fixing; printing-paper; washing.—A small quantity of phosphoric acid or any salt of such an acid is intimately mixed with the albumen prepared for covering the surface of the paper used for producing positive proofs. To render the paper sensitive, it is laid upon a solution of silver nitrate and after two or three successive washings in distilled water the proof without undergoing the developing process is submitted in the dark to a bath of hyposulphite of soda containing silver chloride and then exposed for several hours to light while immersed in the hyposulphite bath.

2891. Newton, W. E., [Gibson, W.]. Nov. 9.

Mounting prints and the like; sensitized plates and films.—To the surface of wood, leather, glass, porcelain, earthenware, metals, india-rubber,

gutta-percha, fabrics, and canvas, is applied an adhesive mixture comprising one or more gelatinous substances, and clay or other aluminous matter or oxide of zinc. When dry, the article is treated with an astringent solution and finally passed through calendering rolls. Such enamelled surfaces will be fireproof and waterproof and will be capable of being ornamented by photographic or other prints. An insoluble plate or panel of gelatinous material can be built up, upon a glass surface, by successive applications of the gelatinous mixture and subsequent treatment with the astringent solution. After drying, the gelatinous plate can be removed from the glass.

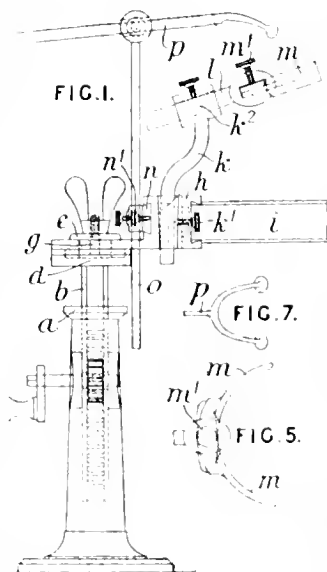
2937. Bünger, W., [Steinheil, C. A.],
Nov. 15.



Lenses.—Two similar lenses of meniscus shape are placed with their concave sides opposite and in such a position that all the chief rays cross each other at the same point in the axis of the lens, which must be curved sufficiently to form an image in a plane normal to the axis. Midway between the lenses is fixed a diaphragm with an aperture much smaller than the lenses.

2949. Sarony, O. Nov. 16.

Studio accessories.—An adjustable stand is used for supporting the body and head of the subject. The pillar *a*, fixed to floor, carries a sliding bar *b*, with rack and pinion and set-screw (not shown). At the top of the bar *b* a plate *g* is clamped between the plates *c, d*. The plate *g* carries a bar *h* the front of which is curved and grooved to receive a curved slide *i* to which



a chair back is attached. The rest of the chair is separate, but the disjunction is masked by a fringe or drapery. A bar *k* slides in a socket with thumb-screw *k'* in the bar *h* and carries a socket *k''* with thumb-screw for the bar *l*. At the end of the bar *l* is a socket with thumb-screw *m'* for the two curved plates *m* which constitute the body-rest. Fig. 5 shows a plan of this part of the apparatus. The back of the bar *h* is grooved to receive a slide *n* with set-screw *n'* and having a socket and thumb-screw for the bar *o* which carries another socket and thumb-screw for the bar *p* of the head-rest. The head-rest is shown in plan in Fig. 7.

2954. Bullock, E., and Bullock, J.
Nov. 17.

Photo-mechanical printing; negatives for photo-mechanical printing, producing: producing transparencies.—Various processes for preparing negatives and plates for photo-mechanical printing are described. One method is to place the copy of a reticulated surface face to face with an ordinary negative, and a transparency is then obtained, from which another negative is taken. From this second negative a printing block can be obtained. In another process, a transfer paper, with reticulations already imprinted upon it, is employed. Ordinary or photographic paper is coated with a glutinous substance, and then printed with the reticulated pattern. The Provisional Specification also describes other methods:—(1) Ground glass rubbed in with a dark-coloured paint may be used as the original negative or may replace the reticulated surface in the first method described. (2) A reticulated fabric may be placed between the camera and the object to be photographed, or copies of such fabrics upon transparent media may be interposed between the negative and the sensitized surface, or placed before the original negative during its exposure. (3) The original negative may be exposed first for a few seconds to the reticulated surface, and afterwards to the object to be photographed.

3053. Newton, A. V., [Egloffstein, F. von].
Nov. 28. [Provisional protection only.]

Photo-mechanical printing. "Relates to the use of a heliographic and photographic spectrum for producing printing surfaces from transparent photographs. The spectrum may be composed of a single sheet of highly polished level ground plate glass, free from colours and covered with a good asphaltum etching ground, heated and smoked over a wax paper in the manner of the engravers' black etching ground. The plate when cooled off is ruled over by the diamond or other point of a correct ruling machine, using light pressure to prevent the chipping off of the ground and the flaking or breaking of the glass. Upon the insertion of an edge guide or pattern, varying in profile from the mathematical line or straight edge of the ruling machine, and guiding

"the course of the diamond or other point, it will be obvious that any system of lines from the straight line to the semicircle with equal or varying intervals can be traced with facility and preserving the perfect parallelism required for the different spectra. The plate prepared to receive the engraving is coated first with a sensitive heliographic varnish. Upon this varnish the spectral image is produced by the light falling through the open spaces of the spectrum made as above described. The spectrum is thus imprinted upon the varnish previous to its receiving the photographic image by means of a second exposure to the light. Both images are thus blended into one, the spectrum giving texture to the photographic image. Then may follow the ordinary heliographic manipulations of developing the picture. The photographic picture overpowers the spectral image"; the "spectrum," however, remains sufficiently strong to hold the printers' ink.

3190. Griswold, V. M. Dec. 11. [*Provisional protection only.*]

Sensitized plates and films; enamelling; fixing; toning.—An opal photographic surface is produced on any prepared material such as glass, japanned iron, cardboard or paper by previously coating it with a white opaque film. This is obtained by means of "Solution No. 1.—Opal collodion," which contains alcohol, sulphuric and acetic ethers, gum kauri, gum shellac, solution of cotton, castor oil, and glycerine. The film must be dried before immersion in the silver bath, which consists of solution No. 1 with a certain proportion of "Solution No. 2.—Sensitiz-

ing" consisting of water, alcohol, muriatic acid, calcium and ammonium chlorides, and bichloride of mercury. The proportions depend on the strength of the ammonia nitrate bath and the desired tone." If the plain silver bath is used with ammonia fuming a smaller quantity of solution No. 2 is used. The ammonia fumes are produced by mixing unslacked lime with ammonia alum. The dried plate is exposed under the negative, then immersed in "Solution No. 2" to which water has been added. The picture is then washed, toned and fixed. For printing in the camera, solution No. 1 is sensitized in the same manner as "bromo-iodized collodion," and then by silver nitrate. The plate is exposed wet and developed as usual; it may be toned with gold chloride and fixed with potassium cyanide or hyposulphite of soda. This last process converts the picture into a negative; it is reconverted by the application of solution No. 2 diluted with water. The picture is finished with "Solution No. 3.—Opal Picture Enamel," which consists of shellac, borax, water, linseed oil, sulphuric acid and albumen.

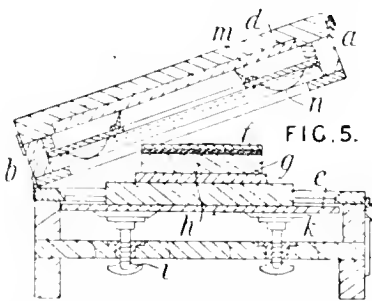
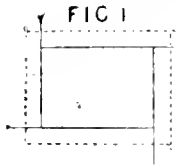
3248. Parker, T., [*Carlevaris, P.*]. Dec. 15.

Lamps, actinic.—A light for photographic purposes and the like, is produced by heating spongy magnesium oxide in the oxyhydrogen flame. The oxide may be obtained in a suitable condition by heating a piece of the chloride or carbonate, supported by a small prism of clay or by platinum wires or other means in the oxyhydrogen flame. The hydrogen used may be pure or mixed with gas, and in place of oxygen, ordinary air, or a mixture of the two may be used.

A.D. 1866.

66. Skinner, J. Jan. 9. [*Provisional protection only.*]

Printing-paper and the like.—Albumenized paper is prepared by floating it upon albumen from eggs, which albumen may be mixed with some gelatinous substance such as arrowroot. After drying, the paper is rendered insoluble by exposing it to the action of steam. After again drying, the paper is coated with ordinary albumen, and dried in the usual way.

105. Woodbury, W. B., and Davies, G. Jan. 12.

Chromo-gelatine processes; cutting and trimming prints; photo-mechanical printing.—For impressions in gelatine or similar material, a method for obtaining which is described in Specification No. 2338, A.D. 1861, a sharp edge and clear margin are produced either by scraping off the superfluous gelatine by four cutters acting simultaneously, or by washing it off with warm water, the central part being protected either by covering it with a plate, or by previously varnishing it with a quick-drying solution such as india-rubber in benzene, or rendering it insoluble by treating with alum solution and drying it. The original impression may be produced on a glass plate coated with wax or other substance which can be easily removed, and is taken off the glass on to a sheet of paper coated with adhesive cement. In another method a press is used in which the impression is taken direct with a clear margin. The cutting-knives used in the first method are to be mounted on a frame and so connected that by one movement of a lever they slide into the outer position, Fig. 1, at the same time being slightly lifted from the paper. The press for the last method is shown in section in Fig. 5. The metal mould *f* is supported on india-rubber sheets *h* on a block *g*, and the bed-plate *e* (preferably of glass) can be adjusted by screws *i* bearing on rubber pads *k*. The paper is placed on a glass plate *d* in the lid, and the edges *m* of a

frame pressed against it by springs *u* bearing against the frame *b* which is fastened to the lid *a* by hooks. Warm gelatine is poured on to the plate, the lid fastened down, and the superfluous gelatine which flows over the edge of the mould is scraped downwards, by pressing down pins which pass through slots in the frame *b*. The lid *a* is unfastened from the frame *b* and raised, leaving the paper with the impression on the mould.

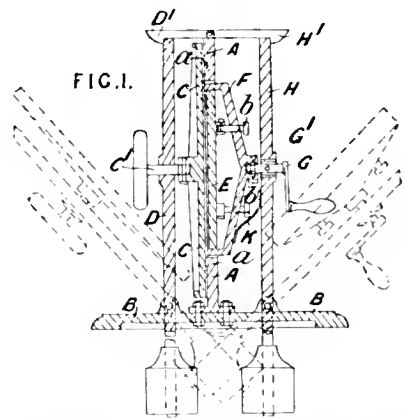
239. Swan, J. W. Jan. 21.

Photo-mechanical printing.—Relates to a method of, and press for, printing from intaglio plates with coloured gelatine or inks, as described in Specification No. 1791, A.D. 1865. Fig. 1 shows a vertical section of the press. The tympan *C* on which the paper to be printed is placed, is carried by a screw *C¹* in a bar *D* pivoted on the base *B* and held in vertical operative position by a catch *D¹* pivoted on a frame or chase *A* fixed in vertical position on the base *B*. The tympan *C* is caused to clamp the paper tight against the rib *a* surrounding the opening in the frame *A*. The intaglio printing plate is attached to a bed-plate *E* adjustable by screws *b* in a box *F* carried by a screw *G* in a nut *G¹* in a pivoted bar *H*, held in vertical position by a pivoted catch *H¹*. Weights on the lower ends of the bars *D, H*, tend to hold them in vertical position. The nut *G¹* is pivoted in the bar *H* so that the plate on the bed *E* may be moved into an inclined position, indicated by the dotted lines, by withdrawing the screw *G*, the lower edge of the box *F* being held in contact with the tympan by a spring *K*. When the plate is in this position, its surface having been previously greased, and the damped paper is clamped by the tympan, a measured quantity of the gelatine &c. ink is injected by a

pipette or other means into the space between the plate or paper. The screw G is then operated to force the plate gradually into vertical position against the paper, the ink being thereby caused to rise and occupy the intaglio parts of the plate. A vent may be provided at the top for escape of ink in case more is used than is required for the impression.

324. Winstanley, D. Feb. 2.

Photo-mechanical printing.—Relates to a method of obtaining from a gelatine or other relief, or a metal or other intaglio, produced by the aid of photography, a printing-surface consisting of dots (1) uniformly distributed but varying in magnitude, or (2) equal in magnitude but not uniformly distributed. (1) A series of wires or the like having uniform conical, pyramidal, or other points is caused to descend into the depressions or uneven surface of the relief or intaglio. The whole is then turned so that the wires are horizontal, the relief or intaglio is removed, the wires are bound together, and the points are planed, cut, ground, or otherwise reduced into one plane, and will consequently be of different magnitudes. In the first part of the operation, the wires are held in a frame, and are loosened and caused to descend upon the relief or intaglio by vibration, falling, mechanical pressure, magnetic attraction, or otherwise. In the second part of the operation, binding of the wires is effected preferably by mechanical pressure from two sides of the frame; or by pressure from one side, using a distorted negative; or by thermal expansion, preferably using a brass frame and iron wires; or by partial fusion, by means of material adhering to the outer ends, by the use of an induction coil, or otherwise. In order to hold the points during the cutting or grinding process, lead or type metal may be run in and subsequently melted out. Casts or impressions may be taken from the wire surface in type metal or other material, for copperplate printing, or for producing casts or facsimiles in more fusible or plastic material for block printing. (2) For the production of a surface consisting of dots equal in magnitude but not uniformly distributed, a frame containing very fine uniform wires is used with the plate prepared for block printing, or, preferably, with the plate prepared for copperplate printing, such plate having been ground from behind until every point is just represented by a hole. By pushing the fine wires through these holes, a deeper cut printing-plate is obtained. The surface may be planed, cut, or ground, or casts or impressions in reverse or facsimile may be taken, as described above. Stereotypes may be obtained by laying the wire surface in a box of fused type metal; or the bases may be connected by type metal to form a cushion in producing stereotype matrices by pressure or percussion.

396. Dallmeyer, J. H. Feb. 8. [*Provisional protection only.*]

Lenses.—A combination to embrace a large

angle of view, say 100° on a plane surface, consists of three thin single non-achromatic lenses, two of crown glass and one of flint glass. The anterior crown lens may be plano-convex, or nearly so, with the convex side outside. The posterior crown lens is a deep concave meniscus, also convex outside. These two lenses preferably differ in focal length. Between the two lenses a diaphragm is placed, dividing the space between the lenses in the ratio of their foci. Almost immediately in contact with this diaphragm is placed a flint glass lens, plano-concave by preference, and of such focal length as with the two crown lenses above named will form an achromatic whole.

449. Gilpin, C., [Kossuth, F., and Kossuth, L. T.]. Feb. 13.

Photo-mechanical printing; printing; negatives for photo-mechanical printing, producing; developing; sensitized plates and films; producing transparencies.—Relates to the production of copper or other metallic plates for the purpose of printing therefrom. To obtain the said plates, a photographic glass plate coated with collodion and bearing the positive or negative image of the object or design to be printed is, whilst still wet, plunged in a heated solution of potassium bichromate and gelatine, and a similar solution is then poured on it to form a uniform thickness on the glass plate. The layer of gelatine is then exposed to light, and washed or developed in baths of warm water and in a bath of warm water and tannic acid, or water and glycerine, to produce a relief plate or design, preferably by dissolving away the unexposed gelatine. After drying, the plate is made electrically conductive for electrotyping by treating it with an alcoholic solution of nitrate of silver and then subjecting it to the action of hydrogen or sulphuretted hydrogen to reduce the silver. A printing-plate is then made by electro-deposition on the prepared plate or mould. The image on the said photographic glass plate for relief plates is obtained by taking a transparent positive image from a negative photograph of the object &c. to be reproduced on which a striped plate of glass has closely been applied. For intaglio engravings a negative photograph is taken from the object, the said negative being grained or shadowed with lines or dots. When line drawings &c. are to be reproduced, the graining of the photographs may be dispensed with. Various methods of producing the "grain" are described. One method consists in the use of a lined glass plate in contact with the sensitive surface. The lines may cross each other or otherwise, and are made with a diamond point and blacked when required. The lined plate may be applied to the picture &c. to be photographed or to the photographic plate. The image of a grain previously formed on paper by lithography may be taken by photography. To produce the grain at the same time that the object is photographed, a camera is employed that has two object glasses opposite to each other and on the same optical axis, the object and lined &c. plate being both focussed on the photographic film, and simultaneously photographed.

469. Henry, M., [*Arct. II.*] Feb. 14.

Chromo-gelatine processes for producing images in relief. An image is first made on a glass or other translucent plate by the collodion process or otherwise. The film side of the plate is then provided with a wax rim, and coated within this with a strong solution of gelatine, gum, or other organic substance, mixed with potassium or ammonium bichromate. The uncoated side of the plate is next exposed to light for a proper time, lateral lighting being excluded if the film is thick. The film is then washed to remove the unacted-on parts of the gelatine &c., and dried. The film may be rendered colourless by applying nitric acid or otherwise, and again coated, exposed, and washed, to heighten the relief. In a modification, a separate sheet of bichromatized gelatine is printed from the plate.

Photo-mechanical printing.—A metal plate is made by electrodeposition from the gelatine relief, either directly, after metallizing the gelatine with silver nitrate or otherwise, or indirectly from a mould, made by applying to the gelatine relief a sheet of plastic material, such as gutta-percha mixed with Venice turpentine and a little spirit of turpentine. The metal plate may thus have the image either in relief or sunken, and may be used for printing in ink, to reproduce engravings, drawings, maps or manuscripts; or the plate may be used for embossing, or for figuring china.

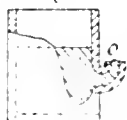
Negatives for photo-mechanical printing, producing.—A regular grain is produced by photographing a pattern of fine white lines on a dark ground, or dark lines on a white ground, with the camera; the pattern may be a piece of white net stretched over a black cloth on a large frame. A print on paper, from a grained negative, may be used as a portable pattern. The net and the object may be photographed by successive exposures on one sensitive plate. Or a negative of the object may be placed in contact with a grained plate made from the net only, and a copy made of them on another plate. Or a grained plate may be applied to a sensitive plate, with their collodion films or surfaces in contact, while the object is photographed on the sensitive plate in a camera. The grained negatives of objects containing half tints may be used in making chromo-gelatine reliefs and metal printing plates, as described above.

Printing.—Prints having an artistic effect are made photographically from the grained negatives, on paper.

473. Newton, H. E., [*Jaubert, L.*] Feb. 14.

Lenses.—A simple periscopic lens is built up of a number of superposed layers. Small spherical lenses are made by forcing fused glass by fluid pressure through a small aperture *o*, Fig. 23 (Sheet 5).

FIG. 23. (Sheet 5)



For the purpose of forming lenticular masses of glass built up of layers of, it may be, different optical properties, the apparatus shown at Fig. 24 is employed. Over a gas blowpipe *c* a cup *g* of platinum or fireclay is mounted on the upper end of a shaft *B* driven by a pulley *P*. A lump of glass is placed in the cup *g* and then, whilst in a liquid state, it is rotated until it assumes the desired shape. A second or more lumps of different glasses are then treated in the same way. The glass is transferred from the furnace to the apparatus by means of a platinum brush, through the handle of which gases are fed to a burner which keeps the glass in a molten condition. Lenticular masses may also be built up by superposing plates and putting them into an annealing oven to cause them to adhere. A flux of white sand, minium, and calcined borax may be employed. The optical properties may be made to vary from the centre outwards by superposing cylindrical sheets, Fig. 31, and then drawing the mass out into a rod. Various substances may be interposed between the sheets.

FIG. 24. (Sheet 5)

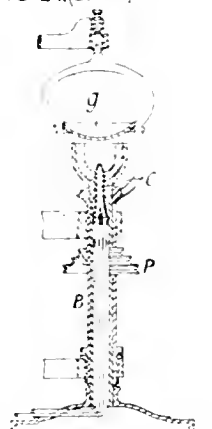


FIG. 31. (Sheet 5)



Enlarging.—In an optical projecting-apparatus in which the lens is built up in layers, the adjustment for focussing is effected by means of screw guides, and a rotary and reciprocating motion is given to the object holder. The apparatus is stated to be employed also for photographic enlarging.

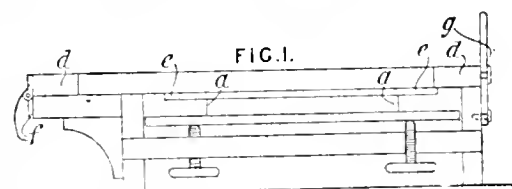
797. Ashton, R. H. March 17.

Photo-mechanical printing; negatives for photo-mechanical printing, producing; negatives, producing by other means than photography; producing transparencies.—Pictures obtained by the Woodbury photo-relievo process described in Specification No. 2338, A.D. 1861, on paper,

glass, porcelain, or other transparent or semi-transparent material, may be tinted by first printing the surface with the desired tints, and afterwards applying the photo-relievo picture. Also the process may be applied to pictures other than photographs, and a method of combining other figures with the photo-relievo picture is described. In the Woodbury process, coloured gelatine is poured on an intaglio surface, the depression in which corresponds to the light and shade of a photograph, and the paper, glass or other material is pressed on the surface, squeezing out the superfluous ink, and forming, when stripped from the mould, a picture in varying thicknesses of ink, which soon dries almost flat. The intaglio surface, according to the present invention, may also be formed without the aid of photography, by embossing, or by scraping away the parts of a drawing on wood, and pressing the surface; so obtained against a soft metal surface, or by electrolytic, or other process. Surfaces formed by photography may be combined with those formed otherwise, into one moulding surface; also figures may be combined with the photographic surface by painting them in black on the negative, and printing the colourless part so obtained on the positive either before or after the Woodbury process by chromo-lithography. When tinting the pictures, in order that the tints obtained by the chromo-lithographic printing may register with the picture by the Woodbury process, registering pins project from the mould *a*, Fig. 1, and pass either through holes in the plate or paper *e*, or at the side of the plate &c., which is clamped to the mould until the gelatine is set by a hinged frame *d* with hinge *f* and catch *g*. Adjusting-screws are provided to adjust the level of the plate carrying the mould *a*. With glass, porcelain, or other hard surfaces, angle pieces are employed instead of registering pins, and in every case similarly-placed marks to act as guides are made in the colour-printing surfaces. The colouring may also be done by hand. The gelatine print may be transferred from one surface to another (coloured) one by coating the first surface with india-rubber solution, and when nearly dry, applying it to the coloured surface. On removing the first surface, preferably paper, after being steeped in water, the gelatine print is left on the coloured surface.

820. Laroche, W. S. March 20. [*Provisional protection only.*]

Studio accessories.—This invention consists in placing the persons whose portraits are to be taken in front of a background, and placing in front of and close to the sitters a screen or frame about six feet high and five feet wide, covered with canvas, and having an opening cut in the centre of it of any required size or shape. The opening is surrounded with ornamentation. The screen or frame is made to slide up and down a groove in a framework, and can be raised or lowered to suit the height of any person or persons by means of counterweights with ropes running over wheels fitted to the framework, or by means

of a rack and pinion at the side of the framework, worked with a crank handle, or in any other suitable manner. By means of the ordinary camera and processes the frame and sitters are photographed at the same time, the result being a complete picture of any size with portrait and ornamental frame complete.

887. Ramage, J., and Nelson, T. March 26.

Photo-mechanical printing.—A solution of gelatine and bichromate of potassium or ammonium is spread over a sheet of suitable material, preferably tinfoil, to a thickness according to the relief desired, and, when thoroughly dry, is exposed to the action of light through a photographic negative of the design, engraving, drawing, &c. from which a printing surface is to be produced. The plate or sheet, with the gelatine surface, is then immersed in cold water until the parts unaltered by the light swell up to give the required relief, and the excess of water is removed by blotting paper. A solution, in carbon bisulphide, of one part of asphalt, three parts of gutta-percha, and one part of india-rubber, previously dissolved in benzol, is poured over the surface of the gelatine which, when dry, forms a hard skin. The edges of the metal plate are then turned up all round to form a tray, which is then filled with a composition of six parts of beeswax, four parts of paraffin, and two parts of asphalt. On removing the wax block, when dry, the design will be in relief upon its surface, from which an electrotype or stereotype printing-surface is obtained in the usual way. The process is applicable to the formation of printing-surfaces for hand-stamps or plates for copper-plate printing, but in the latter case a photographic positive instead of negative is employed for obtaining a print on the gelatine.

980. Cox, E. April 5. [*Provisional protection only.*]

Developing-tents.—Portable dark chambers or tents are described for photographic manipulation in the field, and for containing and transporting the necessary apparatus. An oblong box contains a washing trough, tap and tubing, cistern, chemicals, and bath. The hinged lid of this box carries an additional flap, and to each end of the box is hinged a corresponding flap, so that all actinic light may be excluded from the operator while manipulating, by means of the said flaps (when elevated) and a tent cloth suitably stretched across the tops of the said flaps and secured to the waist of the operator. The tent cloth may be carried in the box, beneath the above mentioned trough. A four-wheeled carriage, constructed with a tank or reservoir, may be used to transport the box from place to place; it is also provided with suitable arrangements for carrying the requisite tripods, and other similar appliances. When necessary to dispense with the carriage, as in ascending mountain passes and elsewhere, the

upper part of the box with the cover, flaps, trough or sink, and other necessary details may be made capable of removal from the box or case, so as to be carried with the tent cloth and other apparatus by poles or otherwise, and set upon portable legs capable of being screwed or otherwise attached to it."

987. Grüne, W. April 6. [*Provisional protection only.*]

Producing photographs of special character; developing.—Photographs are rendered invisible by soaking them in a solution of chloride of mercury, washing, and drying. To reproduce the photograph, a sheet of filter paper, which has been soaked in hyposulphite solution and dried, is placed over the print, and the two moistened. The picture is washed several times and dried.

1179. Hedler, C. April 26. [*Provisional protection only.*]

Masks and masking.—A narrow white border, enclosed within a wide black or darkened border, is produced around the picture, by exposing the printing paper, first, with the border covered so as to produce the picture, and then with the centre of the paper covered, so as to leave a border around the picture unacted upon by the light.

1285. Rock, T. D. May 5. [*Provisional protection only.*]

Tripod stands.—The legs of a tripod stand, for telescopes and other instruments, are made of extra large diameter and provided with cavities for receiving the telescope, or other instrument, swivel holder, levels and other instruments. The legs are connected to a centre piece or cap, similar to the top of the stand, by stays or stretchers, each consisting of two brass rods, one sliding within the other and clamped in position by a binding screw. The telescope, or other instrument, may be mounted on the lower centre piece, when required for use in a low position, or when the stand is to be closed up, in which case the swivel holder and stays rest in cavities in the sides of the legs. The cavities are suitably lined, and the whole stand and instrument are enclosed in an oilskin, or the like, for transport.

1315. Woodbury, W. B. May 8. [*Provisional protection only.*]

Ornamenting by photography.—A metal reverse is taken from an insoluble photographic gelatine mould, such as is described in Specification No. 2338, A.D. 1861, and from this reverse is obtained an electrotpe in thick metal. The electrotpe is then heated, and pressed upon the surface of the wood, ivory, velvet, cardboard, or other substance, capable of being blackened by heat. In another method, the wood, paper, or

other material may be treated with some chemical substance, which is darkened or blackened by the application of heat.

1334. Dallas, D. C. May 9.

Photo-mechanical printing; negatives for photo-mechanical printing, producing; producing photographs of special character.—Relates to the production of printing and other surfaces in relief or intaglio. The design is photographed, drawn, painted or transferred upon a glass plate in a medium that wholly, or partly, intercepts the actinic rays of light. Bitumen of Judaea in turpentine, Indian ink, sepia, or other colour may be used for drawing or making the design. Over the design a solution of bi-chromatized gelatine or gum &c. is poured, and when the coating is sufficiently dry the uncoated side of the plate is exposed to light. The parts not acted upon by light are then softened and caused to swell by treatment with cold water; this is poured off and the design is repeatedly washed with warm water till the design is free from the gelatinous mixture, and allowed to dry. Increased relief may be obtained, (1) when the original design has been produced in bitumen of Judaea or like material, capable of withstanding the washing above described, by re-coating the surface with sensitive solution, again exposing to light, and repeating the washings and drying; repetitions of the process give the desired amount of relief; (2) by damping or causing the insoluble design to absorb moisture; (3) when the original design has been produced in a soluble material, the said design may be obliterated by the solvent without injury to the insoluble relief, leaving the glass bare at those parts where the coating is dissolved, an increase of depth being thus produced. A granulated surface may be produced on the relief, such as is required when a copper-plate printing-surface is to be made from it, by laying all over it an aquatint ground, or dabbing the surface with a sticky material and sifting powdered rosin thereon. A mould or reverse of the surface is taken by electrotyping, casting, or pressure. The mould or cast may be taken in melted sulphur, or in a composition of gutta-percha and oil, or in a solution of gelatine or glue, or in stereotyping material such as plaster, paper, &c. Stereotyping moulds may be taken from the original relief or from the reverse. A mould or reverse may also be made with thin tin lead or other foil by beating or otherwise pressing it on to the relief and backing it. The process is applicable to the production of printing or embossing plates, or raised surfaces for use in pantograph engraving-machines. Intaglio surfaces prepared as above may also be used for printing in half tones by the photo-relievo process.

1364. Southwell, W. H., Southwell, F., and Southwell, E. May 12. [*Provisional protection only.*]

Mounting prints.—The lithographic stone to be used for printing a ground &c. for photographic

prints, is recessed at that part of the surface which corresponds with the desired position of the print upon the mount.

1641. Dallmeyer, J. H. June 18. [*Provisional protection only.*]

Lenses for photographic and especially architectural work are made of three simple lenses, the first and third of which are crown glass and positive, the intermediate lens being of flint glass and negative. The anterior lens is a deep concave meniscus with the convex side outwards, and is made larger than the posterior lens, which is plano-convex with the convex face outside. The intermediate lens is plano-concave with the plane side facing the anterior lens. Spaces are left between the lenses, and to obviate distortion, a stop is placed between the posterior and intermediate lenses at the optical centre of the combination. Portrait lenses, which consist of two corrected lenses with a space and stop between them, are made with the anterior combination larger than the posterior combination. To prevent both landscape and portrait lenses from giving painfully sharp detail in one plane, and too little in another, the lenses are so mounted that the distance between them may be varied at will. In this way any desired amount of aberration may be produced, and the focus spread over a certain space.

1786. Field, L. July 6. [*Provisional protection only.*]

Printing.—A printing-frame comprises two flaps, hinged together so as to close upon one another, and having studs on the edge of one to take into holes in the edge of the other. One flap comprises an inner frame and a sheet of glass to support the negative, which frame is supported in the flap by openings so as to press the negative against the printing paper or surface in the other flap. This second flap comprises a panel having a number of slots in which is adjustably fixed a pneumatic plate holder, supporting the printing paper or surface.

1918. Woodbury, W. B. July 24.

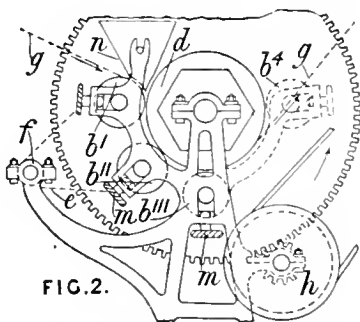


FIG. 2.

Photo-mechanical printing.—Relates to methods

of and apparatus for printing by means of soft metal intaglios prepared from photographic gelatine reliefs, as in the process described in Specification No. 2338, A.D. 1864, or other analogous manner. The gelatine relief is pressed into a true-surfaced cylinder of lead or lead alloy, by means of a reciprocating table or a steel cylinder. The table is formed with a plane surface and runs on adjustable rollers. A separate machine may be used for this purpose, or the printing-machine may be modified to effect the impression. The same machine may be used for smoothing the surface of the paper to be printed, by substituting a polished steel roller for the soft-metal cylinder. The indented soft-metal cylinder is placed in the printing-machine, at *d*, Fig. 2. Pressing-rollers *b*¹, *b*¹¹, *b*¹¹¹ press the paper *g* against the cylinder *d* and are adjustable by screws *m*. A metal band *c* may be arranged to run round two or more of the pressing-rollers *b*¹, *b*¹¹, *b*¹¹¹, and round a roller *f*. Warm gelatinous or other semi-transparent ink flows on to the paper at the point where it first comes in contact with the cylinder *d*, from a hopper *u*. If the impression is not sufficiently set when the paper reaches the roller *b*¹¹¹, an additional roller *b*¹ may be provided, to keep the paper longer in contact with the cylinder *d*. The pressing-rollers *b*¹ & *c* may be made of glass tubing cemented on metal shafts and ground with a true and polished surface. The cylinder *d* is geared to a driving-shaft *h*. In place of the gelatinous ink from the hopper, a fatty or other ink of a plastic consistency may be spread on the paper, by any suitable means, before it is passed between the cylinders *d* and *b*¹, *b*¹¹, & *c*. In this case the paper is rendered non-absorbent of grease in any suitable manner, and the cylinder *d* is damped by a felt roller & *c*, to prevent the greasy ink from adhering to it. Another method of printing with the plastic ink is to apply it to the roller *d* and level it on the surface by a roller or scraper. Glass, gelatine, or mica may be printed with this composition for the production of transparencies. A plastic ink may be made by mixing transparent oil colour with mastic soap and beeswax; or a water colour may be mixed with starch, arrow-root, &c.

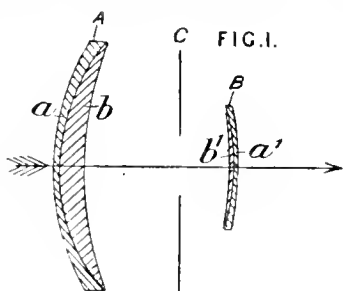
2355. Bing, L. Sept. 13. [*Provisional protection only.*]

Actinometers.—To measure the actinic power of light numerically, a graduated transparent medium is used consisting either of overlying plates of tale, glass or suitable material or a wedge-shaped vessel filled with liquid, and behind this a sensitized strip of paper is exposed. The wedge-shaped vessel tapers in the two directions of its length and breadth to one corner and the lower transparent surface of the vessel is divided into a series of squares commencing from this corner.

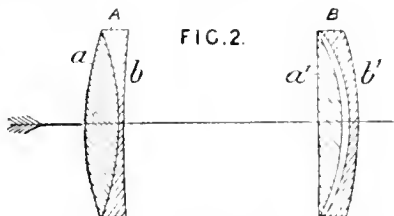
2502. Dallmeyer, J. H. Sept. 27.

Lenses.—Fig. 1 shows the construction of a wide-angle lens designed to give freedom from a flare spot, and to produce an image corrected for

central and oblique spherical and chromatic aberrations, and for inequality of illumination. Two similar combinations A and B, each of double the focal length of the compound lens, are separated by about one-seventh of that distance. The diameter of the front combination A is twice that of B, and the stop C divides the distance between them in the same proportion. Each combination is preferably achromatic in itself and in each the



flint lens occupies the exterior position. Fig. 2 shows a double combination lens intended chiefly for portraiture, in which the amount of spherical aberration may be regulated by slightly varying the separation of the elements of one combination, without deranging the other corrections. The elements *a* and *b* of the front combination A, and *a'* and *b'* of combination B are of crown and flint glass respectively. The focal lengths of A and B



are as 2 to 3, and the distance between them is one-third of the focal length of the compound lens. The elements *a'* and *b'* are separated by a small space which is adjustable by means of a screw or otherwise. The adjustment may be applied to the front instead of the back combination, but in that case the elements of the front combination are reversed. This method of regulating the spherical aberration may be applied to lenses with more than two combinations.

2641. Grüne, W. Oct. 12. [Provisional protection only.]

Developing; producing photographs of special character.—In order that the ammonia vapours, evolved when tobacco or cigars are smoked, may be used to reproduce or redevelop silver photographic prints, which have been rendered invisible by mercuric chloride, cigar holders and pipes are constructed with a transverse aperture, over which the prepared paper is fastened by gum &c.

2869. Briges, M. de. Nov. 5. [Provisional protection refused.]

Producing distorted photographs.—Grotesque portraits are obtained by the use of cylindrical, spherical, or other shaped mirrors, the image formed by them being photographed. Parts of such portraits may be combined with others obtained in the usual manner.

2939. Skaife, T. Nov. 10.

Lamps, actinic.—An actinic lamp comprises a spring-actuated vibrating platform, with one or more touch holes, on which platform is placed the substance to be burnt. At the moment of lighting the substance, the platform is set vibrating, so as to produce instantaneous combustion of the substance.

2997. Bernieri, L. Nov. 15.

Photo-reliefs; printing; masks and masking.

—Photographic back-grounds are provided with inscriptions, or heraldic or other devices, so as to obtain a medallion-like appearance (see Figure). For this purpose the inscription or device is written or printed upon the ground glass or semi-transparent surface surrounding the image upon the negative, so that, by covering the portrait or other part of the plate not required to be acted on by light, the said inscriptions or devices may be printed upon the paper or card.



3002. Grüne, W. Nov. 15.

Ornamenting by photography.—Relates to photographic and chemical processes for reproducing engravings, lithographs, drawings, woodcuts, pictures, and designs in gold, silver, platinum or other metals on porcelain, glass, gold, silver, and other metal surfaces. A picture or design is produced on a negative plate and blackened by platinum chloride, then dried and covered with a flux and annealed. A picture film is obtained from this negative by pouring iodised collodion over its picture side, submitting it to the action of silver nitrate solution, placing it in a frame, and exposing it to light, transmitted through the negative. The plate is then placed in a solution of iron sulphate and sulphuric acid; the portions acted upon by light appear in silver, and the plate is washed, fixed by sodium hyposulphite, and again washed. The picture film is separated from the negative by

immersion in water containing glycerine, and is treated with chloride of gold, platinum, palladium, iridium, or other metallic salts, according to the colour it is to receive. The picture is then bathed in a solution that will colour it by impregnation of the matter of the film; by annealing it afterwards, various combinations in different metals may be obtained. The film is transferred to the object to be decorated by immersing the film and the article together in a large vessel filled with a mixture of water and glycerine. The film is applied to the surface by means of a hair pencil; a coat of flax is then laid on, and the article is annealed, burnished, and polished in the usual way.

3113. Courtenay, R. H. Nov. 26. [*Provisional protection only.*]

Photo-mechanical printing.—Relates to the production of engraved printing-surfaces on metal plates or rollers by the aid of photography. A print from a negative is taken on transfer paper prepared with a solution of gelatine, sugar, albumen, potassium or ammonium bichromate, or both, mercury bichloride, and sodium hyposulphite; or on ordinary photo-lithographic transfer paper. The design is inked, sponged, dried, and transferred to the metal surface, which may be of zinc, or metal coated with zinc, or, preferably, a thin copper plate soldered on a thicker zinc plate and provided on the face with an electro-deposition of zinc. The surface is etched with nut galls, cleaned with a mixture of Venice turpentine, spirits of turpentine, linseed oil, varnish, and a solution of gum arabic, and rolled up with a mineral ink, composed of copper, iron, or other metallic oxides, Venice turpentine, wax, and other fatty matters, or of metallic oxides, gutta-percha solution, and fatty matters. The back is varnished with asphaltum and wax, the zinc is removed from the uncovered parts in weak acid, and the surface is arranged as an anode separated by a porous partition from a copper cathode, in a solution of commercial sal ammoniac, common salt, copper or zinc sulphate or chloride, or other salt, or weak acid, or, preferably, an alkaline solution. The design is gradually stopped out with asphalt varnish, and the battery strength is increased as the etching proceeds. For an intaglio plate, a transfer is made to a zinc-coated copper plate, which is etched and rolled up with mineral ink

as described above, except that the bolder parts are built up with asphalt varnish, or with mineral ink mixed with gum arabic. The plate is submitted to the action of acidulated water, dried, and treated with plumbago or a mixture of white and gold bronze powder, for the production of a copper electrotype.

3177. Winstanley, D. Dec. 3. [*Provisional protection only.*]

Producing photographs of special character: photo-reliefs.—To obtain a bas-relief of an object such as a bust, it is placed in a chamber to which light is only admitted by an adjustable aperture fitted with a reflector for the purpose of distributing the light equally. A negative of the object is then obtained by means of a camera in the chamber, the light being strongest for those parts nearest the aperture, and from this a mould in chromatized gelatine is produced which may itself be used for embossing or for casting plaster or other bas-reliefs.

3221. Lane, F. Dec. 6. [*Provisional protection only.*]

Printing.—To the back piece of a printing-frame is attached a spring clip which serves to hold together the paper and the negative at one end, and to the front edge of the same piece is hinged a flap. Fastened to the flap are spring clips carried by pieces which slide in sockets so that they can be withdrawn and replaced when it is necessary to examine the print. The back piece and flap are covered with black velvet, cloth, or other elastic material.

3303. Swan, J. W. Dec. 15.

Mounting prints.—Prints mounted with gelatine are steeped in a solution of chrome alum, or other chromium salt. The prints may be mounted with a mixture of gelatine or gum and chrome alum dissolved in water and used immediately after making up, or they may be mounted with plain gelatine upon paper wetted with the chromium solution. The process renders the gelatine insoluble.

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